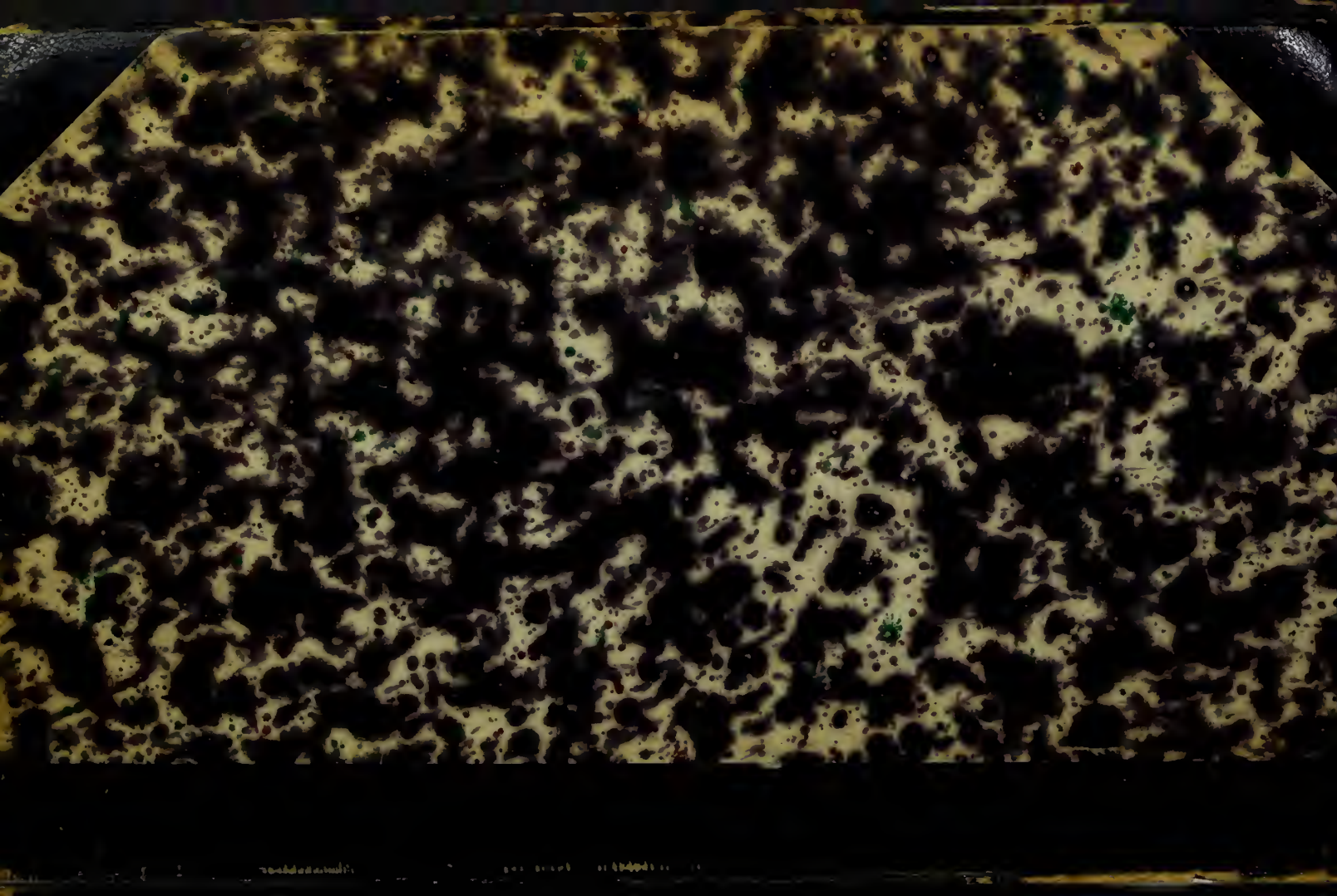

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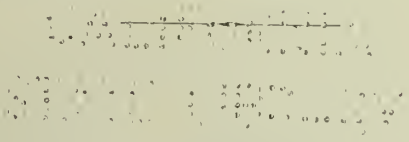

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CALIFORNIA TEACHER.

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[*For the California Teacher.*]

FUNDAMENTAL PRINCIPLES OF TEACHING LANGUAGE.

TRANSLATED FROM THE GERMAN BY MRS. LANE.

III.

Having now spoken, firstly, of the principles of teaching language, I will, secondly, designate what, in my opinion, are the main points in the plan of teaching language; these, however, need not necessarily be considered in the following order:

a. This instruction is to be given conjointly with a reading-lesson. The reason why is found in the foregoing. But it is not meant by this that *all* oral instruction or discussion in regard to language, not connected with a reading-lesson, is to be avoided. On the contrary, such separate discourse is often advisable.

b. The reading lesson is to be read by teacher and by pupils in conformity with the foregoing requirements, and, when too long or when the ability of the pupils is insufficient, then, by questioning, let it be drawn out by sections or paragraphs from the pupils themselves, or, where possible, let them repeat it by sections.

c. Unintelligible or obscure expressions which, in reading, questioning, and recitation, have been brought to the notice of the teacher, are to be explained to the pupils and erroneous ideas corrected.

d. The reading lesson is to be considered in its separate sections—that is, the principal or larger groups are to be noticed.

e. The different thoughts contained in the separate sections or larger groups of thoughts, are to be so brought out that the learner becomes aware of them. By mere reading these thoughts pass in too quick succession through the child's mind, so that, often, the child does not know what he has read.

f. The particular manner of utterance or expression of these separate thoughts is remarked upon, also the reference or relation of these thoughts to each other, and herewith we enter upon the proper and peculiar sphere of instruction in language. Here the attention is to be fixed upon the separate sentences of the reading-lesson, and the pupils must learn to perceive the signification of the phrases and separate parts of the sentence, their relation to the complete sentence and the ideas and forms of words, etc., thus introduced. Still further, this will lead us to notice classes and families of words, separate words, and the manner of writing them. In this treatment of Instruction in Language in its essential characteristics, I would offer to consideration the following points confirmed by my own experience:

1. Not to dwell too long upon the reading of one and the same piece. In general but few lessons are to be given to one selection. Otherwise, besides the danger of losing the interest of the pupil, we also fail of our aim in bringing before the young mind many and varied forms and structures of language—language-pictures—and neglect many other things already mentioned. What one is thus obliged to omit in regard to one piece selected for reading, can be introduced in regard to future ones.

2. In this method of linking instruction in language to a reading lesson, it is necessary to keep to some systematic order of gradual progress. By this I mean that the teacher is not to lay hold indiscriminately of some reading lesson and then speak promiscuously of grammar, orthography, etc.; but that, having fixed upon the subject matter to be taught and arranged it in the form of a successive series, he shall, in connection with this selection for reading, take up one or more of these themes according to their order. Whatever is introduced that is new

to the scholar, must be held before him until he has obtained a conscious knowledge of it, although it may not be possible to dwell upon it till it becomes fixed in his mind. Hence the advancement made is but slow. If necessary, one and the same theme may be made the subject of several selections for reading. When the whole series, or a greater part of it, has been concluded, then make a summary review.

3. What has already been treated of is to be renewed and fixed in the mind of the learner by continual repetition. This can be done, in part, in reading lessons in which something new is to be developed, and, partly, in reading lessons selected at pleasure, solely for the purpose of review.

4. Minor items, for example, an interrogation point is placed after a direct question, that the name of a person is always commenced with a capital letter, as, also, the particular place in which he resides, etc., may be introduced at pleasure, wherever the reading lesson offers opportunity.

5. It is not necessary, in the discussion of a reading lesson, studiously to exclude all and everything which according to the teacher's plan should be fully treated of only at a later period. If an especially appropriate opportunity offers, or if it is necessary to the understanding of anything, then, so far as needed, let the teacher make previous mention of these things.

6. Oral instruction is to be aided by written exercises. Of this it is necessary to speak more fully. The need of such written exercises rests not merely on the desire to fill up certain school-hours, or to give suitable employment to the child at home, but also on the fact that in oral exercises the minds of the scholars of the class are not all equally active, that we cannot take so especial a hold of the thought of each as in written exercises. As a rule, in oral questioning, only the one to whom the question is addressed becomes fully active in thought, while with a large part of the remaining scholars who are interested to a greater or less degree, the attention paid is, at least, less spontaneous. In written exercises, on the contrary, every scholar must give his full attention and turn his whole mental power to the subject before him.

To obtain, in oral exercises, from each pupil the same degree of spontaneous activity which is aroused by written exercises,

would involve a greater expenditure of time than a teacher can usually afford. The teacher would never have time enough to convince himself whether each separate scholar had fully comprehended the subject spoken of, or to what degree he had comprehended it. Thus, for this reason too, are written exercises necessary, if the teacher does not wish to go on building up a structure without knowing beforehand that a sure foundation has been laid by each of his pupils. The examination of these written tasks will first render it possible for him to gain a correct knowledge of the result, in each of his pupils, of his teaching, while, at the same time, it will serve as a necessary guide for subsequent oral instruction; such knowledge is, moreover, indispensible to every teacher who does not desire to beget in his pupils a knowledge that is broken, disjointed, unconnected, and often erroneous. But granted that the teacher has sufficient time for such oral exercises, he would hardly avoid a certain sense of tediousness which enters with the diminution of mental activity in a majority of the pupils. It would be chiefly among the most ready and capable scholars that a condition of restlessness and uneasiness would arise so soon as the teacher should be forced (an unavoidable circumstance) to busy himself with those naturally more dull. Nothing is more dangerous to the child's interest in learning, and also for discipline, than this sense of tediousness and the uneasiness and discomfort proceeding from it. Hence oral exercises must often be interrupted at a point when, for a larger or smaller part of the pupils, it is necessary to continue them. This continuation constitutes the written exercises which again force the more capable scholars to spontaneous activity.

The result of all this is the necessity of written exercises demanded by instruction in language in its different branches; and, from these points of view, instruction in language in its treatment of each of its different subjects, divides itself into three departments. These are: First—Awakening of the intellect. Second—Oral exercises. Third—Written exercises.

The question as to what constitutes the special province of these written exercises, is easily answered by pointing out that they should be nothing else than a continuation of the oral exercises. One must also know what oral exercises are to be

linked to every rule of orthography, grammar, or rhetoric which has come under discussion with the pupils. Since, however, all oral instruction cannot be adapted to written exercises, many because requiring too much assistance from the teacher, others because too lengthy for written recital, or because beyond the orthographic skill of the pupils, a selection must be made suited to conditions, and what is to be required stated somewhat in this form: All oral exercises must also be prepared in written form, so soon as this form does not exceed the capacity of the pupils. The more nicely graduated the steps of the course, from easier to more difficult, which the teacher follows in these exercises, so much greater the number of exercises possible.

[*For the California Teacher.*]

SENSE-PERCEPTION, OR OBJECT TEACHING.

TRANSLATED FROM THE GERMAN BY MRS. LANE.

To please those who would fain refrain from entering on their labor without some more extended classification, I will here attempt to illustrate a method founded upon a somewhat systematic basis. I would, however, first remark:

1. Concerning the amount of the following material, to many it may seem insufficient for one year, to others an overwhelming amount for that period. Who would be able to fix a limit suited to all?

2. In regard to some simple objects made of a single material, I have only given hints which are by no means intended to exhaust the subject; they are but the key with which the teacher is to find and arrange his own material.

3. To the young teacher about to commence his first course of sense-perception teaching, I would recommend, nay, I would beg of him, to furnish himself with a manuscript book, and this by no means a thin one, to crease or rule every leaf in the middle, and on the one half to write out a preparatory exercise on every separate object, leaving the other half for future additions. The lesson itself may furnish additional material, for the

thoughts and remarks of the children often furnish the most valuable matter. We are the teachers of children, but often they are also ours.

4. Do you find the lesson you have prepared too short, review or commence on the next; if too long divide it and continue the subject in the following lesson.

In the following pages I give a few examples of what is to be considered and somewhat of the principle of classification to be applied in regard to the different objects; remarking that these are not complete preparations, but are, and should be, only sketches.

The chief division for the first series is: I. The human body. II. Its needs. III. The child as scholar. IV. The school-room. V. The school-house. VI. The sitting room at home. VII. The sleeping-room at home. VIII. The kitchen. IX. Dwelling-houses. X. Other houses. XI. Country, town, and city. XII. City or town in which the children live.

I. THE HUMAN BODY.—Its name: body. Parts: head, trunk, limbs. Number of parts: one head, one trunk, four limbs. Which parts of the body are double? arms, legs, hands, feet. Material: bones, flesh, blood; hard, soft, and fluid parts. Position of head, trunk, limbs. Changes in the body: growth, sickness, fatigue, heat, cold, injuries, death.

Animals also have bodies. What animal has a small body? what one a large body? what one a long body? what one a thick body?

1. THE HEAD.—Form: round. Position: on the trunk. Parts: forehead, back, top, crown, face. Natural covering: hair. Baldness: little babies, old men. What men and boys wear on head: hats, caps. Hats and caps made of: straw, silk, felt, fur, cloth. What women and girls wear on their heads: bonnets, hats, caps, nets, ribbons, wreaths, flowers. Motions of head: nod, bow, shake, turn, hold upright. Headache. Heads of animals.

2. THE TRUNK.—Position: below head, above limbs. Parts: chest, abdomen, back. Limbs attached to trunk: legs, arms. Relative position of parts: abdomen below breast, etc. Motions of body: bend, turn. Dress: shirt, pants, vest, coat, jacket, uniform, overcoat. Condition: stout, thin, slender, crooked (humpback). Rules: bathe, wash.

3. THE LIMBS.—Name: arms, legs. Position: arms above and on each side; legs below and near together. Number: two legs, two arms. Dress: same as trunk. Number of parts of body: of which parts have we one? of which two? of which ten? of which too many to count?

4. THE HAIR.—Place. Color: black, white, brown, blond, reddish, grey. Kinds: smooth, bristly, curly. Length: long, half-long, short. Purpose: warmth, ornament. What is done to the hair: comb, brush, cut, oil, curl, braid, coil, etc.; difference in youth and age. What is made of hair: rings, brooches, chains. Beard: mustache, side-whiskers, full beard. Rules: comb, brush, keep clean; not let hang in eyes, not pull other's hair. What animals are covered with hair?

5. THE EARS.—Place: each side of head. Parts: external or outer, internal or inner. Number. Use: to hear. What we hear with them: (names of different sounds), singing, speaking, music, rustling, rattling, thunder, ringing of bells, clapping, cracking, rolling, etc. What causes these sounds? What sounds do we like to hear? What do we not like to hear? What injures the hearing? explosions, blows. Deafness. Wax of the ear: its purpose. Ornaments for the ears: rings (gold, jet, pearls, etc.) Rules: keep clean. How? with what?

6. THE FACE.—Place: it forms the front part of the head. Parts: brow or forehead, nose, eyes, temples, cheeks, mouth, chin. Relative position of these parts: above, below, between. Color: red, white, pale (negro, chimney-sweep, etc.) Other appearances: swollen, thin, sunken, smooth, bearded. Youth: full, rosy. Age: pale, wrinkled, haggard. Motions: laugh, weep, look joyful, angry, ashamed, friendly, sullen. Rules: wash; not cut, make grimaces, nor be vain of a pretty face. Disfigured by: small-pox, burns, cuts.

7. THE FOREHEAD.—Place. Material: bone, skin. Surrounded by: hair, temples, eyes, nose. Youth: smooth. Age: wrinkled. Motions: wrinkle, frown, or scowl. Rules: keep clear and unclouded.

8. THE EYES.—Place: below—at both sides. Number: two; right, left. Parts: eyebrows, eyelids, eyelashes, eyeball. Use of different parts: eyebrows (color) to protect from perspiration—ornament; eyelids to protect from dust and other things—

to make more safe in sleep; to clean the eye frequently as we wipe the window glass; eyelashes, to shut more closely, to protect. Seeing. What do we see? form, size, color, motion, nearness, or distance of things. Forms seen: round, angular, long, short, broad, narrow, sharp, dull, smooth, rough. Sizes seen: large, small. Colors: green, red, etc. Motions seen: running, jumping, hopping, swimming, flying, turning, trembling, riding, etc. What things are near? far? (Diminution of size according to distance.) Motions of eye: open, close, wink, turn, roll, stare, squint. Aids to eye: spectacles, opera-glass, spy-glasses. Blindness. Tears; whence do they come? when shed? (joy, grief.) Rules: keep clean; not look at dazzling light (sun, fire); not read with dim light; not hold book too near.

9. THE NOSE.—Place: below, above, between. Form: straight, crooked, short. Parts: ridge, point or end, bridge, nostrils. Use: breathe, smell. What we like to smell: flowers, food, fruit, perfumes. What we do not like to smell: decayed fruit, spoiled eggs, decayed meat, dead animals. Ornaments: rings (savages.) Noseblecd. Rules: hand or handkerchief before it when you sneeze; keep clean; always carry handkerchief; not snuffle; always breathe through nose when possible.

10. THE MOUTH.—Place: below, above. Parts: lips (upper and under), teeth, tongue, gums. Color: red. Use: speak, eat, whistle, breathe, sing. Motions: open, close, distort. Rules: wash out; keep closed; not distort; not bite or draw in lips. Different names for different animals: beak, bill, snout, muzzle. What animals have a beak, etc.?

11. THE TEETH.—Place: in mouth; upper jaw, lower jaw. Number: twenty eight to thirty two. Kinds: incisors or cutting teeth, canine or tearing teeth, molars or grinding teeth. Color: white; diseased teeth: yellow, brown, black. Functions: biting, holding fast, chattering, grinding. Use: to chew, talk, ornament. Youth: complete, white. Age: fallen out, hollow. Toothache. Extracting teeth. Artificial teeth. Rules: brush, wash, bite no hard substances, not eat too many sweets, not pick with needles or pins.

12. THE TONGUE.—Place: in mouth. Form: long, thick. Color: red (fever, white coating.) Motions: very mobile; can be stretched, shortened, drawn back, laid at top of mouth,

arched, rolled. Use: to speak, whistle, taste. Rules: not to smack, not to run it out of the mouth. Bible—The tongue is a little member, etc.; swearing, praying, praising, abuse.

13. THE NECK—Place: between. Characteristics: thin, thick, short, long. Use: to support the head; contains the trachea or windpipe, and the œsophagus or gullet. Motions: turn, bend backwards and forwards. Dress: scarfs, cravats, collars, ruffles, chains, ribbons. Rules: not wrap too much around it; not dress it too tight; wash; not bend too far backwards. Necks of geese, horses, swine, etc.

14. THE CHEST.—What are the principal parts of the trunk of the body? Parts of the chest: ribs, heart, pit of stomach. Motions: heave, sink, expand, contract, beating of heart. Rules: not dress too tight; upright position in standing, walking, sitting—throw chest forward.

15. THE HANDS.—Left, right. Parts: wrist, palm, fingers. Number. Parts of the finger. Only two thumbs. Nails: number. Use: ornament, protection, defense, scratching. Rules: pare or cut, not bite off, not scratch others with them.

Purpose of the entire hand: to eat, wash, dress, defend, work, etc. What kind of work? file, bore, plane, hammer, cut, sew, etc. Defense without weapons: to push, strike, seize, hold fast, strangle. Fists. Defense with weapons: sticks, clubs, swords, daggers, pistols, etc. Artistic accomplishments: perform music, drum, write, draw, paint, embroider, engrave. Dress: gloves. Rules: keep clean, not to play with in the school room. Monkeys and apes have also arms and hands.

16. THE LEGS.—Right, left. Number. Parts: thigh, knee, lower leg, calf, ankle, foot. Motions: extend, draw up, lift, bend stoop. Uses: to stand, walk, run, skip, jump, dance, climb, swim. What people make great use of their legs in doing their work? Organ players, letter-carriers, soldiers. Changes of condition: fatigue, lameness. Rules: not to be foolishly bold in jumping. Broken legs. What animals have two legs? four? six? eight? more than eight? What objects without life also have legs?—tables, chairs, etc.

17. THE FOOT.—Number: right, left. Parts: ankle, heel, sole, toes (ten.) Compare toes with fingers. Uses: to stamp

(same as of legs.) Dress: stockings, shoes, slippers, boots, spurs, skates. Rules: turn outwards in walking, not sprain by leaping, not tread too heavily in the house, not tread on worms under your feet.

[*For the California Teacher.*]

PRIZE ESSAY ON FROEBEL'S KINDER-GARTEN SYSTEM.

After citing, last month, leading thoughts and passages from Froebel and Pestalozzi, let us now notice:

I. The effect of Froebel's system of education founded on a mathematical basis, upon the child's impulse to activity.

II. The effect upon the bodily and mental development of the child.

III. In conclusion, the influence which the kinder-garten may be expected to have upon the subsequent school.

Froebel desires the different series of toys (gifts), and the industrial devices for the preparatory school training of childhood to be considered as members of a complete whole. According to their nature and qualities they are to be connected together like the links of a chain; they are to constitute a world, in which the pupil shall find collected all the plastic elements which he seeks and which he needs; they are to constitute a microcosm, by means of which he learns to comprehend the macrocosm.

I. The effect of Froebel's system upon the child's impulse to activity, shows itself most clearly and simply in the ball. The smallest child, the nursling, will put out his hand to grasp the ball placed before his eyes, particularly if, as Froebel would have it, it be brightly colored. As an experienced observer and keen judge of the tender age of childhood, he makes the ball the first gift. The ball corresponds perfectly to the child's impulse to action which it raises in the graduated scale of impulses, as he learns first to grasp the ball with his little hands, then to roll it hither and thither, then to throw it and again catch it. Suspended from a string or fastened to something else, it is equally well adapted to busy the playing child.

The second gifts, spheres, cylinders, and cubes are indeed

better adapted to the teaching of the larger pupils of the kinder-garten; nevertheless, the smaller ones also find pleasure in rolling hither and thither the sphere.

The third toy, a cube divided into eight parts, is of especial excellence in its effect upon the child's impulse to activity, since it corresponds to his instinct to break a toy in pieces in order to learn how it is made. Again and again does he begin his putting together of the third and fourth toys, and cries out with joy when he can represent the principle of continual change with the eight longitudinal tablets.

Among the gifts of the second group, of plain figures, the longitudinal tablets in their different forms, please children more than the sticks of the same group which are to be ranged together; while, on the other hand, the cross sticks are his greatest favorites. They never weary of endeavoring with their little fingers to form the sticks into some regular figure, a star, an interlacing double triangle, etc. The putting together of rings arouses their activity in a most pleasing manner, while they fit rings and half rings together with special delight.

The larger pupils take hold of the industrial devices really belonging to the kinder garten, as a whole, with pleasure and delight, and often with astonishing perseverance. Most of them, in a short time, make visible progress in drawing within the squares into which the surface of the slate is divided, and take the greatest pains to draw a perpendicular line, a horizontal line, an oblique line, a right angle, a square, and finally a little house, chair, table, etc., in the fixed squares of the slate. Not less willingly do little girls, particularly, occupy themselves with embroidery, which is a kind of drawing with the needle. Folding together and cutting out is an occupation as pleasant as useful for the children, especially since most of them have an inherent desire to get hold of scissors. Finally, the child's desire to be occupied, finds its most complete gratification in weaving or platting, and here it is indeed astonishing to see what little children not more than three or four years of age, who have been trained by a skillful kinder-garten teacher, are able to do. In this it is not so much the artistic pattern—for to imitate such would be too difficult and hence not adapted to a little child—which attracts the attention of the beholder; it

is rather the neatness, the cleanliness, the perseverance with which the little workers manufacture their work. This bears witness that the child's impulse to activity is not only stimulated to a high degree, but is improved.

II. The effects of Froebel's system of education upon the bodily and mental development of the child submitted to this preparatory training, have already been testified to by so many distinguished teachers, that it is a hard task for me to add anything new or interesting in regard to the matter. Still I shall attempt, what as yet has been done but too little, to bring out more prominently, to throw more light upon the importance of the mathematical foundation upon which Frobel rests his system.

It is very much to be desired that not only in large cities, but also in the country, public kinder-gartens might be opened, in order to gain for the subsequent school not only a greater number of pupils from these institutions, but also their mathematical knowledge; for acquaintance with the fundamental types, with the forms found in nature, with those met with in every-day life, is needed by every one, and by none more than by the pupil in the common school. These types and forms surround us everywhere, so that everyone should be forced to acquire an intelligent idea of them. But the majority of mankind know nothing thereof, and look upon them with unthinking gaze. The object of Froebel's teacher is to obviate this absence of thought. Every one is to gain an insight into the simple structure of the world of form out of the elementary and fundamental types, to observe the law which prevails in the infinite multifariousness of their combinations. This insight, first awakened in the kinder-garten, is to be extended in the subsequent common and higher schools, for use and benefit in the education of the race.

If we examine the first group (the first six gifts) of Froebel's system, we find it consisting entirely of stereometrical forms, which are to be the very first things given to children to amuse and occupy them. The characteristics of this group are moderate size, material, and adaptedness to be grasped; hence it is wholly suited to smaller children, who so gladly take into their hands everything which comes before their eyes.

In the second group we pass from solids to plane figures. The longitudinal tablets form the transition. Planimetric figures, lines and outlines of figures, are now introduced to the child's eye. Forms of beauty, forms of every-day life, forms of which he has learned to take cognizance, and which he has already tried to construct with the stereometrical bodies, he now constructs from these right-angled, obtuse angled, and acute angled tablets, from the little flat sticks, cross-sticks, and jointed sticks.

In the constructing of rings he learns the curved line, the circle, and the semi-circle. The circle is the periphery of the ball, the sphere, and the cylinder.

The industrial devices in the kinder garten, progressively advancing like the foregoing groups of gifts, like them are also founded upon mathematical principles and ideas. In drawing within the squares outlined for him, the child endeavors to imitate and represent for himself the straight and the curved line; he begins to combine two rigt-angles into a square, two acute-angles into a rhombus, two obtuse angles into a parallelogram, etc. In weaving, together with symmetrically arranged quadrilaterals, he especially busies himself with counting; in folding and cutting out he attains great accuracy in the representation of triangles, squares, and angles, as with free hand or by aid of scissors and spatula he arranges the primary figures in such a way as to produce the most varied and numerous pictures of his imagination from forms of beauty and of daily recognition. The occupation of pricking out and of working with peas, which, as well as that with pasteboard and of modeling are only suitable for the older pupils of the kinder-garten, make them acquainted with the point; and the two latter, passing from the plane to the plastic, introduce the pupils into the kingdom of art, and in case of any artistic talent among them, this gives opportunity for making the first artistic studies.

If children too young to be sent to school be prepared therefor, by one or more years of kind and affectionate treatment, by judicious active sports, singing, and the telling of suitable stories, by Froebel's devices for amusement and industry, there is no doubt that the least gifted among them would acquire clear ideas of the fundamental mathematical types, and become

skillful in shaping and reproducing them, either through building them by the arranging of the little sticks, or by some other method of kinder-garten instruction. If we now ask ourselves in exactly what manner acquaintance with the mathematical forms influences the bodily and mental development of the child, the answer is: that they cultivate or draw out the child, and are thus useful and beneficial to the learner, to the future pupil of the subsequent school, to the student in the higher institutions of learning. But here, too, we may show the advantages which, according to their nature, the different gifts and industrial devices exert.

The strengthening of the muscles, together with healthy nourishment, contributes most to the promotion of physical development. The muscles of the child, cultivated by Froebel's system of education, are daily strengthened anew through playing with the ball and sphere. For instance: in rolling the sphere upon the floor not only the arms become strengthened, but, by the stooping motion of the child, the feet also, as well as the whole body, and, more especially, the abdomen. In his occupation in the amusements of building and fixing sticks crosswise, in braiding, folding, embroidering, and cutting out, the child's fingers are cultivated to a high degree of dexterity; and in these occupations, as well as those of lacing, drawing, pricking out, working with peas, and modeling, the child's power of measuring with the eye is kept in constant activity and pre-eminently cultivated. The child learns to touch accurately, and to see accurately, excellencies which the pupils of the kinder-garten have beyond those of all other institutions where nothing is done for the perfecting of the senses. Rather do we very often find the children in the dark school room short sighted (in regard to which Dr. Cohn points out very remarkable and accurate proofs), and crooked from the narrow seats which they occupy.

For the advantages to the mental development of the child, which arise from acquaintance with the primary mathematical forms, we have not far to seek. What man of culture would assert that the early knowledge of the triangle could injure the child; that the idea of an angle and skillfulness in representing the same would be too great a tax upon the child's power of thinking.

If the child were urged forward in the acquisition of this knowledge, there might then be some truth in such an assertion ; but, thanks to Froebel's method, it is while the child is playing that he becomes acquainted with stereometrical bodies as well as planimetrical figures, with the angle as well as with the circle, and finally with the point. He comprehends that the ball and the sphere are perfectly round bodies ; he convinces himself that both may be set in motion by the application of a very slight degree of force ; he remarks that when rolling on a surface each of these has a twofold motion, viz.: the motion around its axis, and the forward motion. If he compares these bodies with the cube, the representative of rest, he perceives that the latter, as well as the former, is a graspable body, that it has six sides, eight corners, and twelve edges ; that the cylinder, the connecting link between sphere and cube, possesses some characteristics of each ; that, like the sphere, it has a curved surface and is easily moved, like the cube two flat surfaces, and also represents a state of rest. Finally, it comprehends that the cube and tablets have straight lines in common with the little sticks ; ball and cylinder, curved lines in common with the circle.

With the cube divided into eight parts, the third and fourth gifts, the child begins to count and to exercise all his mental powers : understanding, imagination, æsthetic sense, and will. In his building, particularly if he succeeds with his stairs and towers, he becomes acquainted with the laws of physics ; for example : with that of equilibrium, and that of gravity. He begins to distinguish between living forms and those of science and æsthetics, and to represent the same either by his own invention or by copying from nature.

With the fifth gift with its twenty-seven cubes, of which three are divided into diagonal halves, and three quadrilaterally, the child acquires a knowledge of oblique surfaces ; next comes the prism as a solid, and then the planimetric figures of the triangle, parallelogram, and trapezium. The Pythagorean theorem is also easily represented by the building up of the figure which is to prove the theorem, according to Euclid's method of demonstration. Finally, with the sixth gift, the child learns one more stereometrical solid, namely—the parallelopiped.

[*For the California Teacher.*]

THE FOOD WE EAT.

The metamorphosis of the food in the human body is a study, both important and interesting—important on account of its hygienic value, and interesting on account of the wonderful changes that it undergoes in carrying out the different purposes for which it is employed. The body is composed of the food we eat, undergoing a rapid and constant metamorphosis at the rate of about six pounds per day. In a properly nourished man a stream of food is constantly entering the body in the form of highly complex compounds, and leaving it in the form of carbonic acid and water through the skin and lungs, and of a nitrogenous compound called *urea*, eliminated by the kidneys.

The principal agent in this metamorphosis is *oxygen*, which, entering into a chemical combination with the elements of food, develops heat and force; thus in the food are stored up heat arising from chemical action, and force (motion) and sensation (mental activity) through the instrumentality of nervous energy. Thus food is converted into heat, force, and sensation; the first of which is entirely subservient to the second, and the second to the third. For convenience and study food may be arranged in four groups;

Groups of Food.
1. Carbo-hydrates—Types: starch, sugar, etc.
2. Hydro-carbons—Types: animal fats and oils.
3. Proteins—Types: albumen, casein, fibrin, etc.
4. Salts—Types: common salt (chloride of sodium), phosphates of sodium, and calcium, etc.

The first and second groups contain no nitrogen, and, as this element is an essential constituent of animal tissue, it must be derived from the third group, hence it is called "protein" (to be the first), and because it contains *all* the essentials of food, it ranks as first in importance.

The first group (starch, sugar, etc.), is chiefly derived from the vegetable kingdom; and its chief use is by oxidation, to maintain the proper temperature of the body, being burned as lactic acid, or converted into fat by the liver, enters into combustion in that form.

The second group is employed to maintain bodily heat in a frigid atmosphere. It is derived from both the vegetable and animal kingdoms. In high latitudes the inhabitants are com-

pelled to employ fats and oils in large quantities to sustain the bodily temperature, but in warm countries the first group is sufficient for that purpose.

The third group has for its object an entirely different purpose, namely : that of forming tissue to repair the waste of the body, occasioned by the development of muscular force and mental activity ; such waste finding an escape from the body through the kidneys.

The fourth group is derived wholly from the mineral kingdom, and affords material for carrying on the nutritive process, as an element in the formation of hydrochloric acid, and the chlorides of potassium, sodium, calcium, and ammonium in the gastric juice, and the phosphates of calcium as an element of nutrition in the formation of bone.

The use of food, then, is twofold : first, to develop heat ; and, second, to form the tissues of the body.

The hygienic value of the study may be summed up thus :

I. A well-arranged dietetic scheme must consist of a due combination of the above mentioned groups of food, varied to meet the requirements of nerve, muscular activity, and changes of temperature ; as, first, when an unusual amount of nerve-muscular activity is put forth, a greater proportion of the third group must be employed, and this is most advantageously derived from the animal kingdom ; second, in low temperatures, a greater proportion of the second group is required to maintain the heat of the body ; and for this purpose animal fat is the most economical, but in high temperatures starch and sugar are better.

II. An habitual excess in either of these groups tends to the production of a particular constitutional state, termed *Diathesis*, which may manifest itself in a great variety of modes :

1. An excess of the first group tends to the production of *rheumatic diathesis* which consists in the malassimilation and wrong metamorphosis of the components of the tissues, specially favored by the undue proportion of lactic acid or some other product of the metamorphosis of the saccharine compounds.

2. An excess of the second group tends to the production of the *bilious diathesis*, in which, through the insufficient elimina-

tion of hydro-carbonaceous matters, the blood becomes charged with elements of bile.

3. An excess of the third group, such as is likely to occur when too large a proportion of animal food is employed, gives rise to the *arthritic diathesis*, consisting in the presence of imperfectly assimilated tissue-making substances, and wrongly metamorphosed products of disintegration, not duly eliminated in the kidneys, manifesting itself more especially in *gout* and *gravel*, also modifying the course of other diseases.

4. The principal source of error in regard to the fourth group arises from the employment of salt (chloride of sodium) in the preservation of meat, fish, etc. The evil consists partly in an excess of the salt, and partly in impairing the quality of the food, by extracting its juices, and rendering it hard and indigestible. Therefore, animal food thus preserved is not as valuable as that which is fresh, and when long confined to it, it tends to the development of *scrofulous diathesis*, especially when there is a deficiency of the second group; and to the *scorbutic*, in the absence of fruits and fresh vegetables.

E. J. Schellhous.

THE TEACHER'S PREPARATION FOR HIS WORK.

One kind of preparation which is needed is, that those who teach make teaching, for the time, their sole business. With very many it is a mere episode, as in the case of the young man who taught a large school and read law at the same time, doing a full day's work in the latter, whatever he did in the former. It is not meant that the teacher should be thinking of professional work all the time, or that he should never read anything which does not bear directly on that work; but he must be a rare man who can do the highest work professionally, and as much of it as is laid on our teachers, and find time for very much work in other lines during term time.

A literary preparation is also needed for each day's work. We do not mean that the teacher should go over, in full, all he is to say or do; that he is to prepare every question he is to ask, and, as some do, the answer that must come to the ques-

tion, for this would result in just the cut-and-dried work we reprobate. A good preparation for work requires the teacher to go over the subject carefully, in order to freshen his memory, and to fix clearly in his mind the points in the lesson which are of prime importance, those about which all else centers, and also the recollection of some method of presenting them, to be followed as far as practicable, or the marshaling of many methods, of which the one best fitted for the exigencies of the case is to be chosen at the time of recitation. There should always be something definite to be accomplished by each day's work. If it is an advanced class which will go over considerable ground in the recitation, a topical outline on a small piece of paper is, perhaps, the best help a teacher can have. This he can prepare when looking or thinking the lesson over the night or morning previous. These should be as brief as possible, that the teacher may not be "confined to his notes." This kind of preparation is very common, and perhaps the necessity for it is generally acknowledged.

There is another preparation for our work which is less generally acknowledged than those which have been mentioned. We do not know enough of our pupils as boys and girls, as individuals. We are too apt to think of fifty pupils as fifty times one, and that one ourself perhaps, or some one to whom we have been of great use as a teacher. The worst of it is that our eyes are often so closed that we do not, even after a long experience, discover that the problem is one in addition, and not one in multiplication. (We wonder if this is because we know the multiplication so much better than the addition table?) The tendency of close grading is to confirm us in this mistaken notion. Much of the teacher's real success will depend on how he meets and grapples with the difficult question here presented. The teacher should be a close student of human nature as it appears in the specimens before him. Two children will never be found who need the same treatment, till two are found who are alike in being and surroundings. A field opens here before the teacher as large as he can cultivate, and work as hard as he can do, but work the doing of which will bring a great reward. To do machine work, and yet not to do it, is the problem which is set many of us. An old-fashioned, mixed,

country school is not an unmixed evil, and to give the closely graded school what of good there is in the former is giving the pupil's individuality a chance to assert itself, and demands close thought and hard work. The difficulty of the problem should stimulate us to the solving of it. Here the last is first in importance. Preparation for our school work that we may aid in the forming of the pupil's character is of more worth than preparation for the more distinctively school work, as the end is higher than the means.

The community demand, or should demand, of us, that we do our work with singleness of purpose ; that we come to it fresh, knowing what we are to do, able to make every blow tell, and that as far as possible we recognize and adapt ourselves to the differences we find in our pupils, whether those differences be due to birth or education.—*Maine Journal of Education.*

SCIENCE AND OUR EDUCATIONAL SYSTEM.*

BY F. A. P. BARNARD, LL. D., PRESIDENT OF COLUMBIA COLLEGE.

Our long-established and time-honored system of liberal education—and when I speak of the system I mean the whole system, embracing not only the colleges, but the tributary schools of the lower grades as well—does not tend to form original investigators of Nature's truths ; and the reason that it does not is, that it inverts the natural order of proceeding in the business of mental culture, and fails to stimulate in season the powers of observation. And when I say this, I must not be charged with treason to my craft—at least, not with treason spoken for the first time here—for I have uttered the same sentiment more than once before in the solemn assemblies of the craft itself.

I suppose, Mr. President, that at a very early period of your life you may have devoted, like so many other juvenile citizens, a portion of your otherwise unemployed time to experiments in horticulture. In planting leguminous seeds you could not have failed to observe that the young plants come up with their coty-

* Address at the Tyndall Banquet.

ledons on their heads. If, in pondering this phenomenon, you arrived at the same conclusion that I did, you must have believed that Nature had made a mistake, and so have pulled up your plants and replanted them upside down. Men and women are but children of a larger growth. They see the tender intellect shooting up in like manner, with the perceptive faculties all alive at top ; and they, too, seem to think that Nature has made a mistake, and so they treat the mind as the child treats his bean plant, and turn it upside down to make it grow better. They bury the promising young buds deep in a musty mould formed of the decay of centuries, under the delusion that out of such *débris* they may gather some wholesome nourishment; when we know all that they want is the light and warmth of the sun to stimulate them, and the free air of heaven in which to unfold themselves. What heartless cruelty pursues the little child-martyr every day and all the day long, at home or at school alike ; in this place bidden to mind his book and not to look out of the window—in that, told to hold his tongue and to remember that children must not ask questions ! A lash from a whalebone switch upon the tender little fingers too eagerly outstretched could not sting more keenly, or be felt with a sharper sense of wrong, than such a rebuke coming across the no less eagerly extended tentacles of the dawning and inquiring intellect.

Now, a system of education founded on a principle like this is not going to fit men to engage successfully in that hazardous game of life in which, in Prof. Huxley's beautiful simile, we are all of us represented as playing with an unseen antagonist, who enforces against us relentlessly every minutest rule of the game, whether known to us or not. Still less can it fit them to bring to light new rules of this difficult game, never yet detected by any human intelligence. Yet it is precisely of this kind of men that the world has present need. For, grand as are the triumphs of scientific investigation already achieved, it is impossible to doubt that there are still grander yet behind to reward the zealous laborers of the time to come. I know that it sometimes seems to us otherwise ; I know that the very grandeur of the achievements of the past makes us sometimes doubtful of the future ; for it is generally true that the portals of Nature's

secret chambers, yet unexplored, are only dimly discernible before they are unlocked.

I remember a time—it is now long gone by—when this skeptical feeling as to the possibilities of large scientific progress in the time to come was extremely prevalent—so prevalent that a learned professor of a neighboring college thought it worth his while to combat, in an energetic public address, the discouraging notion that Nature has no longer any important secrets to yield. Subsequent history has magnificently corroborated his argument. For that was a time when, as yet, no Faraday had drawn a living spark from the lifeless magnet; no Daniell, no Grove, or Bunsen, had given us an enduring source of electro-dynamic power; no Ohm had taught us how to measure such a power when obtained; no Bessel had detected the parallaxes of the fixed stars; no Adams or Leverrier had thrown his grapple into space, and felt the influence of an unseen planet trembling, to use the beautiful language of Herschel, along the delicate line of his analysis; no Draper, or Daguerre, or Talbot, had revealed the wonders of actinism; no Mayor or Jould had laid a sure foundation for the grand doctrine of the conservation of force; no Carpenter had unravelled the intricacies of nervous physiology, or analyzed the relations of mind and brain; no Agassiz had ridden down the Alps on the back of the glaciers and proved their steady flow; no Darwin had lifted the veil from the mysteries of organic development; no Schiaparelli or Newton had put the harness of universal gravitation upon the wayward movements of the shooting-stars; no Mallet had presented an intelligible theory of volcanic flames and of the earth's convulsive tremors; no Kirchhoff had furnished a key to the intimate constitution of celestial bodies or a guage of stellar drift; no Huggins, or Secchi, or Young, had applied the key thus presented to enter the secret chambers of the sun, the comets, the fixed stars, and the nebulæ; no Stokes had made the darkness visible which lies beyond the violet; no Tyndall had done the same for the darkness beyond the red, or had measured the heat-absorbing powers of aeriform bodies, or shown how the tremors of the ether shake asunder the elements of vapors. In short, that period of presumed scientific omniscience seems now, as we look back to it, but the faint dawning

of a day of glorious discovery, which we dare not, even yet, pronounce to be approaching its meridian.

How much of all this has been due to our system of education? Among the great promoters of scientific progress, before or since, how large is the number who may, in strict propriety, be said to have educated themselves? Take, for illustration, such familiar names as those of William Herschel, and Franklin, and Rumford, and Rittenhouse, and Davy, and Faraday, and Henry. Is it not evident that Nature herself, to those who will follow her teachings, is a better guide to the study of her own phenomena than all the training of our schools? And is not this because Nature invariably begins with the training of the observing faculties? Is it not because the ample page which she spreads out before the learner is written all over, not with words, but with substantial realities? Is it not because her lessons reach beyond the simple understanding and impress the immediate intuition?—that what she furnishes is something better than barren information passively received—it is positive knowledge actively gathered?

If, then, in the future we would fit man properly to cultivate Nature, and not leave scientific research, as, to a great extent, we have done heretofore, to the hazard of chance, we must cultivate her own processes. Our earliest teachings must be things and not words. The objects first presented to the tender mind must be such as address the senses, and such as it can grasp. Store it first abundantly with the material of thought, and the process of thinking will be spontaneous and easy.

This is not to depreciate the value of other subjects or of other modes of culture. It is only to refer them to their proper place. Grammar, philology, logic, human history, *belles lettres*, philosophy—all these things will be seized with avidity and pursued with pleasure by a mind judiciously prepared to receive them. On this point we shall do well to learn, and I believe we are beginning to learn something, from cotemporary peoples upon the Continent of Europe. Object-teaching is beginning to be introduced, if only sparingly, into our primary schools. It should be so introduced universally. And in all our schools, but especially in those in which the foundation is laid of what is called a liberal education, the knowledge of visible things

should be made to precede the study of the artificial structure of language, and the intricacies of grammatical rules and forms.

The knowledge of visible things—I repeat these words that I may emphasize them, and, when I repeat them, observe that I mean *knowledge* of visible things, and not information about them —knowledge acquired by the learner's own conscious efforts, not crammed into his mind in set forms of words out of books. Our methods of education manifest a strong tendency in these modern times to degenerate in such a sort of cramming. Forty years ago, the printed helps to learning, now supplied to the young men of our colleges in so lavish profusion, were almost unknown ; and teachers lent about as little aid, at least during the earlier years, as books. What the student learned then he learned for himself by positive hard labor. Now we have made the task so easy, we have built so many royal roads to learning in all its departments, that it may be well doubted if the young men of our day, with all their helps, acquire as much as those of that earlier period acquired without them.

The moral of this experience is that mental culture is not secured by pouring information into passive recipients ; it comes from stimulating the mind to gather knowledge for itself. When our systems of education shall have been remodelled from top to bottom, with due attention of principle, then, if we have minds among us which are capable of pursuing Nature into her yet uncaptured strongholds, we shall find them out and set them at their work. Then neither "mute inglorious Miltons" on the one hand, nor on the other silent, unsuspected Keplers, nor Newtons "guiltless" of universal gravitation, shall live unconscious of their powers, or die and make no sign. Then the progress of science will no longer be dependent, as in the past it has been to so great a degree, on the chance struggles of genius rebelling against circumstances, such as have given us a Herschel, a Franklin, a Hugh Miller, or a Henry ; nor will the world be any more astonished to see the most brilliant of the triumphs of the intellect achieved by men who have cloven their own way to the fore-front, in defiance of all its educational traditions ; as it has seen in the case of a Rumford, a Davy, a Faraday, and a Tyndall.

EDUCATIONAL MISCELLANY.

THE PHYSICAL BEFORE THE MENTAL. — Man is a progressive being only on condition that he begin at the beginning. He can afford to wait centuries for a brain, but he cannot subsist a second without a body. If civilization sacrifice the physical hopelessly to the mental, and barbarism merely sacrifice the mental to the physical, then barbarism is unquestionably the better thing so far as it goes, because it provides the essential preliminary conditions. Barbarism is a one story log tent, a poor thing, but better than nothing; while such a civilization would be simply a second story, with a first story too weak to sustain it, a magnificent sky-parlor, with all heaven in view from the upper windows, but with the whole family coming down in a crash, presently, through a fatal neglect of the basement. In such a view, an American Indian or a Kaffir warrior may be a wholesome subject, good for something already, and for much more when he gets a brain built on. But when one sees a book-worm in his library, an anxious merchant prince in his counting-room tottering feebly about, his thin underpinning scarcely able to support what he has already crammed into that heavy brain of his, and he still piling in more — one feels disposed to cry out, "Unsafe passing here! Stand from under!" — *T. W. Higginson.*

NAMES OF VARIOUS SORTS OF TEA. — The designations by which the various sorts of tea are known in the market may be worth notice, as coming under the more immediate observation of dwellers at home. Congo is a corruption of *Kungfu*, signifying labor, and the Moning Congo advertised by dealers is simply a sort of the same tea grown at *Wuning*, a district and city, the name of which, being interpreted, means "Military Rest." Souchong signifies "little sprouts;" Pekoe, "white down;" Bohea is derived from the *Wuhee* Hills on which it is produced; Oolung means "Black Dragon;" Hungmoey, "Red Plum;" Campoi, "Selected firing;" Hyson, "Fair Spring;" Twankay takes its name from *Tunkee*, or "Beacon Brook;" what is called "Young Hyson" is in Chinese termed *Yutseen*, or "Before the rains;" Gunpowder, the Chinese call *Yuen choo*, or "Round Pearls." There are a number of other names given to tea, but these will

be recognized as those most familiar to the American ear. What are termed "chop names," are the fancy designations given by Chinese dealers to their teas, after having been made up into parcels of so many hundred chests each. The tea is grown in the first instance by small farmers, who carry the produce of their respective gardens to the nearest depot, where it is collected by brokers, and by them made up into chests for delivery to the dealers, who convey it for sale to the foreign mart. These dealers are very particular in the selection of high-sounding and felicitous titles for their several parcels or chops, and very often a particular chop acquires such a fame as to be eagerly sought after for each successive season.

FORMATION OF MOUNTAINS AND VALLEYS. — Our attention is called by a correspondent to the recent promulgation by Robert Mallet F. R. S., of the theory that the formation of mountains is due, not to upheavals of those portions of the earth, but to the sinking of the valleys, resulting from the diminution of the internal heat of the earth. It seems that a similar theory was entertained by J. S. Phillips, M. E., a Cornishman, formerly of North Pool Mine, some time previously, and fully stated by him two years since in his "Explorers', Miners' and Metallurgists' Companion," then published in San Francisco. Referring to the original formation of the igneous rocks, Mr. Phillips remarks that "during these formations the earth's crust or hollow shell would continue to be violently compressed in circumferential dimensions, and being solid it would, from its own gravitation, as it endeavored to follow the still faster contracting interior, crumble and distort certain sections of least resistance into rolling surface contour of hill and dale. In such a state of comparative homogeneity, the partial invasion of volcanic fires had not at this early period really uplifted any mountains; but their apparent elevations existed more from the above causes and the loitering behind of such portions during the general travel when urged by contraction and gravitation toward the centre of the earth." How completely this coincides with Mr. Mallet's theory it is unnecessary to discuss. Mr. Phillips alludes to the continuation of these principles, and he now favors us with a statement of sequent ideas which he entertains, and has embodied in

the form of foot note for his second edition : "As the earth continued its cooling, other internal hollow globes would in like manner be forming from plastic to solid states, which, when compressing laterally, as described in the crumbling of surface mountains, certain portions would then rub violently against the interior of the colder outer shell, and produce such motions as earthquakes, a greater degree of heat and force for the pent-up gaseous elements to release themselves through surface volcanoes." Several other quotations might be given in support of the view that Mr. Mallet has been anticipated by Mr. Phillips, but the above will suffice to show that the theory is not so new as Mr. Mallet has supposed.—*The Mining Journal, London.*

THE CRAMMING SYSTEM.—The New York *Times* dwells on the results of the overwork of children in the public schools. Six hours' study, even for the mature brain, the editor contends, is a good day's work. In this city, most school children are required not merely to devote their five hours to the school, but two or three hours to the study of lessons, which is very trying to the nervous system. The nerves become impatient and morbid, and no proper relief is afforded them in muscular movement. As a remedy for this evil, half-time schools are recommended. With these careful experiments have been made in England, and it has been ascertained that precisely the same mental progress can be obtained with half-time as with full time schools, while the physique is much better preserved. We believe it would be for the interest of all the middle classes of this city (the editor adds) to keep their children in school but three hours per day, and to let their study hours, outside of this, be not more than two. With such a system, the children would learn faster, and would lay up what is the best of capitals for man or woman—a store of vigorous health.

HOW TO READ.—I was once called upon to prescribe intellectually for a young girl of fair abilities who showed no want of brains in conversation, but had a perfect indifference to books. She read dutifully and torpidly whatever was set before her—novels, travels, history—all were the same ; each page drove out the previous page, and her memory was a blank. Her parents

asked me to teach her to read ; she joined in the request, and I consented to the experiment, on condition that she would faithfully read a single book in the way I should direct. She consented. It was the time of Kossuth's visit, when everybody was talking about the Hungarian revolution. The book I chose was "Hungary in 1848," by Brace, of far more interest then than now. I prescribed it in daily doses of one chapter. If possible she was to read that—the chapters being short—but under no conceivable circumstances was she to read more. After each chapter she was to put down in a blank book I gave her, some remark suggested by it. She must mention something that had interested her, or seem the explanation of some word, or anything else she pleased. Her comment might be only to say that Gorgy was a traitor, or to inquire how his name should be pronounced ; but at least there should be one sentence of remark per chapter. From time to time I was to see what she had written, and answer her questions, if any. This was the prescription, and she took it courageously. I knew in advance what would be the greatest difficulty. It was to keep her to one chapter. It seemed to her such a mistake, such a waste of opportunity, when she could so easily manage five or six chapters in a day. Had she done so, all would have been lost ; so I was inexorable. The consequence was that she never failed to read her chapter ; and when she got to the end of it, for want of anything better to do, she read it over again, or went to work with her note-book. It was a very nice note-book, and she wrote a beautiful hand. When I came to look over the pages, every few days, I was astonished at the copiousness and variety of her notes. On some days, to be sure, there would be but a single sentence, and that visibly written with effort ; but almost always there were questions, doubts and criticisms, all of which I met as I could. I found my own mind taxed by hers, and finally reread every chapter carefully that I might be ready for her. And at the end she told me with delight that for the first time in her life she had read a book. Where was the magic of the process ? I suppose mainly in the restraint, the moderate pace, and the necessity of writing something. "Reading," says my Lord Bacon, "maketh a full man ; writing an exact man." To clearly define and systematize what you know, write. — *T. W. Higginson.*

DEPARTMENT OF PUBLIC INSTRUCTION.

We call the attention of school officers to the fact that the School Census Marshal must report to the County Superintendent *before the first day of July*. County Superintendents are requested to carefully examine each report before receiving and filing it. After the census statistics of a county are once reported to us, no change or correction will be allowed.

In accordance with the provisions of subdivision four of section sixteen hundred and ninety-six, we hereby set the tenth of July as the time on which a teacher must make his annual report to the County Superintendent.

County Superintendents will please bear in mind that their reports must be on file in this office on or before the twentieth day of August. No extension of time will be granted.

In the formation of a new district out of an old district three questions have arisen which are submitted for our decision. We give the questions as presented to us:

"*First*—May 7th, 1873, the Board of Supervisors of this county formed a new district by dividing an old district. May 17th a Board of Trustees was elected in the new district. A qualified teacher has been employed since May 7th. On which of the above dates (7th or 17th of May) must I divide balance of school fund to credit of the old district?

"*Second*—Can I legally deduct $50 due a former teacher or salary prior to June 30th, 1871, before I divide the funds, provided sufficient money will be left after said division to finish an eight months' school in the old district, for the present school year?

"*Third*—The Trustees of the old district, through their clerk, informed me last March that they had employed a teacher at $80 per month. In April the Clerk of the Board told me that they were paying the teacher $80 per month, and would draw for what salary was due him at the expiration of six weeks, and accordingly did draw $120. Since the new district has been established the Trustees and teacher claim $150 per month from and after the first week of school, under a new contract made (they say) at that time. Which contract must I recognize?"

To the first question we can give no other answer than the words of the law itself, the time of electing Trustees has no bearing upon the case at issue:

"When a new district is formed by the division of an old one, the County Superintendent must, after payment of debts, divide the money to the credit of the old district at the time the school was first opened in the new district, and such as may afterwards be apportioned to the old district, according to the number of children resident in each district, for which purposes he may order a census to be taken.

The second question is easily answered by referring to section sixteen hundred and twenty-one of the Political Code:

"Section 1621. The Board of Trustees and Board of Education must use the school moneys received from the State or county apportionment during any school year exclusively for the support of schools for that year; but if at the end of any year there is an unexpended balance it *may* be used for the payment of claims against the district outstanding, or it may be used for the year ensuing."

From the above it is plain that the indebtedness incurred during the school year ending June 30th, 1871, can be no legal claim against the district until after June 30th, 1873. As the division of money to the credit of the old district takes place before that time, the fifty dollars must *not* be deducted from the money to the credit

of the old district before making the division. The question now arises which district must pay the fifty dollars? Equity demands that the debt be divided *pro rata* between the districts, and that at the end of the present school year each district pay its share, provided there is an unexpended balance to meet the claim.

The third question answers itself. As the Trustees informed the Superintendent of the monthly salary ($80) to be paid the teacher, and drew an order on the Superintendent at that monthly salary, no other salary (than $80) can be paid until the Superintendent is informed that the monthly salary has been altered. But such altered salary can have no retroactive force, but can at the utmost only take effect from the date of the last order issued by the Trustees.

A CERTAIN TEACHER teaches four months. During that time he has lost five days. At the end of the four months he teaches an extra week, in order to make up for lost time, but does not keep a register for this extra week, so that his register was kept for only seventy-five days, instead of for eighty days, the time actually taught by the teacher. The Trustees refuse to draw an order for more than seventy-five days' salary, the time shown by the register. The case is submitted to us. We must decide that the Trustees are correct in their position; for, as the keeping of a daily register is one of the duties of a public school teacher, the register determines the time for which a public school was maintained. If we permit teachers to dispense with a register for five days, or even for one day, we must permit them to dispense with a register for a month, or for a whole term, or altogether. Teachers are to be paid out of the public school funds only for the time shown by the register, except a teacher attends an Institute, or his pay continues during a vacation.

COUNTY INSTITUTE.

The El Dorado County Teachers' Institute for the present year was held in the hall of the Placerville Grammar School from the 6th to the 9th of May. C. S. Clason and E. Watkins were chosen Vice Presidents; Jacques W. Redway Secretary, and Miss Georgie Kinney Assistant Secretary. Nearly every teacher in the county was present, as well as a host of honorary members and visitors from adjoining neighborhoods. Superintendent Whitman H. Hill delivered the opening address, reviewing the progress of the schools and the action of the county respecting educational matters, applying here and there a little verbal caustic to the tender skin of one or two recalcitrant individuals whose official actions had not been promotive of the interest of the common schools. The Institute was in no wise a convention for mutual admiration, nor was any inclination manifested to ride hobbies. As soon as an organization could be effected, the Institute resolved itself into a class of which Professor Chas. Allen, of the State Normal School, assumed charge. Among others, the following resolutions were adopted:

Resolved, That the thanks of the Institute are due to Prof. Chas. Allen, for his highly instructive lectures during the session; and to the editors of the *Mountain Democrat* for the proffer of an "Educational column" in their paper.

Resolved, That the habitual use of tobacco, fermented or distilled liquors by educators, is highly discreditable, and a sure method of neutralizing their efforts for the mental and moral development of their pupils.

Resolved, That any person who has not enough self-control and moral conscientiousness to refrain from the use of intoxicating drink cannot have enough of the

aforesaid qualities to become a true teacher, and should not be allowed to teach in the schools of the county.

Professor Allen devoted the greater portion of the time in explaining the use and application of his "Number Lessons," a method of teaching the elements of arithmetic, which for simplicity and practicability, is unequaled. Prof. Allen also exercised the Institute in natural history, reading, orthography, and grammar, and by his instructive class drills, he contributed not a little to the success of the Institute. Among the subjects presented were: Objective methods of teaching geography, written arithmetic, penmanship, all of which subjects were handled by experts in a skillful manner. Evening addresses were given by Prof. Allen during two different evenings upon the subjects—"The Child as an Embryo Citizen," and "Home Influences;" by Rev. J. Nowell, "Education as a Means of Establishing Breadth of Character;" by Jacques W. Redway, "A Philological View of Common-place Words;" J. P. Munson, "Review of the Progress of Education;" G. W. Vaughan, "The Old and the New"—a poem.

EDUCATIONAL ITEMS.

THE BADEN SCHOOLS have two courses of study—a short course, and an extended course; the former being arranged for working children who can attend school but a part of each day. The short or "simple" course prevails in rural and village schools which are organized on the half-time, or, more properly, the part time system. We do not think that this plan would work as well in the rural districts in this country as in Baden. Our large farms and sparse population place children too far from school; and, besides, the severe climate of the more northern sections of the United States forbids much profitable farm work in Winter. The four or five months, ending about the first of April, are the most favorable time for the older children of farmers to attend school, and they need to make the most of this opportunity. The half-time system might, however, be adopted with advantage in the lower schools in our villages and cities, and, as we suggested last month, *a half-time course should be added to the present full-time course in the upper grades.* What is needed is an earnest effort to adapt our schools more fully to the conditions and needs of the people, and especially of those who now receive but little schooling. The flexibility of the Badish system is especially noticeable. It aims to meet the industrial necessities of all classes.—*Ohio Educational Monthly.*

AT A RECENT public school meeting held in Danville, Illinois, the school question was discussed somewhat at length, after which a committee was appointed to present the names of six gentlemen as candidates for the Board of Education. The following are the resolutions adopted by the meeting: 1st. In favor of good schools with competent teachers at liberal wages. 2d. In favor of nine months school during the year. 3d. Opposed to the use of the rawhide as a punishment of children. 4th. Opposed to excluding any branch now taught in the schools. 5th. In favor of amending the rules so that parents or guardians can choose the studies they wish their children to pursue. 6th. In favor of a Superintendent of schools. 7th. Opposed to the expulsion or suspension of any scholar except for gross misconduct or

disobedience, or being afflicted with some infectious or contagious disease. 8th. In favor of so amending the rules as not to exclude children from the school premises on account of tardiness. Ordered that the Board of Education be requested to keep the public informed as to their acts and doings. We recommend some of the above resolutions to some of the cities and towns of California.

SOME POINTS FOR YOUNG TEACHERS..—Somewhat personal. 1st. Do not *wait* for your pupils to be courteous to you. You are *teacher* of this particular as much as you are of arithmetic. Always set the example of politeness by bowing and speaking first. Come into your school-house with muddy feet—and your pupils will do likewise. 3d. Retain your hat upon your head while in your school-room, also whistle or indulge in other thoughtless noises—and your pupils will do likewise. 4th. Treat your female pupils with brusqueness and uncourteous inattention—and your male pupils will do *more* than likewise. 5th. Tilt back your chair and place your feet upon the table—and your pupils will do likewise. 6th. Never clean your teeth; also, use tobacco freely—and your pupils will only too soon emulate you in dirtiness of mouth, filthiness of habit, and foulness of breath. 7th. Do not hesitate to spit upon the floor—then your pupils will not hesitate. 8th. Do not clean nor trim your finger nails—then your pupils may not think there is anything slovenly in long and dirty nails. 9th. Continually "hem," and hawk, and expectorate—so that your pupils may acquire the same pleasant habit. 10th. Care very little for personal cleanliness—and your pupils will care less.—*National Normal.*

THE Legislature of Indiana has made several changes in the school laws the past session. County Superintendents are to be chosen in June next, and every two years thereafter. They are to examine teachers, to visit each school in the county at least once a year, to meet with and preside at a township institute in each township at least once a year, and to have the general oversight of the schools of the county. The pay is fixed at four dollars for each day of actual service; and the Superintendent must not act as agent for the sale of books and school apparatus. Text-books are selected by a County Board of Education; but books once adopted cannot be changed for three years thereafter, except by unanimous vote of all the members of the Board. The annual appropriation for the Normal School is increased from ten thousand dollars to fifteen thousand dollars, with two thousand dollars additional for contingent expenses. The State University is to receive fifteen thousand dollars additional appropriation. The rate for the special school tax is doubled. The salary of the State Superintendent is increased, although it is now only two thousand dollars! Aliens and unmarried women who pay taxes are allowed to vote at school meetings. On the whole, the changes put school matters on a much better footing in the "Hoosier State."

NATURAL SCIENCE.—One of the most important measures for the advancement of scientific education that has yet been started in this country is Professor Agassiz's project to establish a school for naturalists on the Atlantic coast, where gratuitous instruction should be given for two or three months, every Summer, to teachers and students from the higher institutions of learning, who might desire to become teachers in these subjects. In behalf of such an establishment Professor Agassiz appealed to the Massachusetts Legislature for assistance to the amount of fifty thousand dollars; but in the meantime, Mr. John Anderson, a wealthy New York gentleman,

living at Tarrytown, on reading this appeal, became interested in the matter and offered to give as a foundation for this school the Island of Penikese, near New Bedford, Massachusetts, with the buildings and furniture, as they had been fitted up for Mr. Anderson's Summer residence. It is one of the Elizabeth group, admirably situated four miles from the main land, twenty-four miles from Newport, Rhode Island, and only ninety miles from the Gulf stream; contains one hundred acres of rich rolling land, and in one part rises nearly two hundred feet above the sea; has the purest water; is remarkably uniform in temperature; has all the facilities needed by such a school; and with all its improvements, has a value of at least one hundred thousand dollars. To this noble gift Mr. Anderson has added fifty thousand dollars in cash, as the beginning of a permanent fund, which Professor Agassiz wishes to increase to two hundred and fifty thousand dollars. The sum of thirty thousand dollars is also needed at once for additional buildings, laboratories, steamer, dredging machine, etc. It is announced that gifts for this purpose may be sent to Wm. Butler Duncan, Esq., or to Howard Potter, Esq., New York. The institution will be open the coming season, and the objects of study will be in part: "Extinct animals of past ages, compared with those now living; animals and plants living in deep water; natural history of fishes and reptiles; natural history of birds and mammals; breeding, nests, and eggs of birds; breeding and improvement of the domestic animals of the farm; breeding of all kinds of fresh-water fish in ponds, lakes, and rivers, and the preservation of our sea fisheries; chemistry of the sea and air; chemistry of feeding and breeding; drawing and painting of animals; microscope, and habits and history of insects injurious to vegetation. These are some of the subjects in which it is proposed to train teachers, not from books, but with the actual specimens and perfect anatomy before them." The endowment, all buildings and property of the school are to be held by the Trustees and officers of the Museum of Zoölogy at Cambridge, and by the connection of these two institutions a continuous course of instruction will be afforded to such as desire it. This school will not belong to Harvard College, or to the State of Massachusetts, but will be controlled perpetually by these officers as a school for the benefit of the whole country. Professor Agassiz asks as a permanent endowment for his school only two hundred and fifty thousand dollars, or an annual income of less than twenty thousand dollars. The modesty of the request is shown by comparing the sum named with the annual income of similar institutions elsewhere. The Zoölogical Society of London has an annual income of one hundred thousand dollars; the Natural History Department alone of the British Museum, one hundred thousand dollars; the Zoölogical Society of Amsterdam, fifty thousand dollars; the Jardin des Plantes, one hundred and twenty-five thousand dollars; the Ken Botanical Garden, London, one hundred thousand dollars; and the Berlin Aquarium, fifty thousand dollars.

CRAFT-SCHOOLS WANTED.—To remedy this aimlessness and unfitness for life which our education leaves our youth, we need more *craft* schools, where boys can become practical engineers, chemists, printers, machinists, and even farmers. The machinist would be none the worse if he should spend his evenings over Euclid instead of lager; the blacksmith, if he knew how to drive home and clinch an argument in metaphysics as skillfully as a horse shoe nail; or the dentist, if he could extract hidden Greek roots with the same facility as grumbling molars. Educated men would dignify any of these employments, and make them sought and not shunned by those

worthy to fill them. A man who wants to run an engine ought to be educated for his business, just as much as a lawyer for his profession. We are a patient and long-suffering people, or we would never permit ourselves to be blown up by hundreds by ignorant engineers, who know nothing more of the monsters which they control than enough to feed them wood and water, and oil up their creaking joints; or suffer ourselves to be sent to our graves by striplings in short jackets, who give us arsenic for paregoric, and strychnine for the elixir of life. The time is coming, and we trust not far distant, when all these positions of responsibility will be filled by men of education, and can be filled by none others; when ignoramuses will be obliged either to fit themselves for their proposed labors, or seek other employments.—*O. R. Burchard, in Scribner's for May.*

In the report of the Superintendent of Schools of New York, it is stated that the total number of those who have attended school during the year is over seventy-eight per cent. of all persons in the State, between the ages of five and twenty-one years. The average time each pupil in the rural districts attended school during the year was sixteen and nine-tenths weeks; in cities, nineteen and three-tenths.

BOOK NOTICES.

Getting on in the World; or Hints on Success in Life. By William Mathews, LL.D., Chicago: S. C. Griggs & Co. San Francisco: A. Roman & Co.

We wish we could place this book in the hands of every teacher. The importance of the lessons taught, the chaste and fascinating style of the author, make the work invaluable to the teacher for self-instruction and for imparting to his pupils noble aspirations, greatness of character, and wholesome and wise counsels upon which to base success in life. The fresh, running, and lively style, the facts and illustrations drawn from every department of knowledge commend the book to all classes of readers. Typography, paper, and binding are almost faultless.

Bancroft's Official Guide Map of the City and County of San Francisco.

This map is accompanied by a very full key of the principal public and private buildings, cemeteries, churches, schools and colleges, parks and squares, hotels, places of amusements, wharves and ferries, etc. It is the best and fullest map of San Francisco ever published for general circulation, and will prove of great help in teaching local geography.

Artificial Memory. The grand method of making a bad memory good, and a good memory better. By Wm. Nemos. San Francisco: A. L. Bancroft & Co.

This little work will amply repay a perusal. The writer bases his system upon the association of ideas, and gives full instruction how to cultivate this association.

Webster's Dictionary.

We have received from the publishers a set of Webster's Dictionaries, from the New Illustrated Royal Quarto, Unabridged, to the Primary School Dictionary. The longer we use Webster's Dictionary, the more indispensable it becomes to us, and the more are we convinced that it is the best. One of the "Unabridged" should be on the desk of every teacher. But those who are not able to buy one of them, will find a very convenient substitute in the National Pictorial Dictionary.

GOOD MORALS AND GENTLE MANNERS. By Alex. M. Gow, A. M. Cincinnati and New York: Wilson, Hinkle & Co.

This is a very useful and convenient work for teachers, and will offer valuable assistance in preparing lessons in Morals and Manners. The book is divided into three parts, the first of which treats of Moral Law, under which are comprised among others, "Duties to God," "Duties to Man," "Right of Property," "Business," "Fidelity," "Amusement," "Wisdom," etc.; the second part treats of Municipal Law; and the third of Social Law, or Politeness.

TABLES OF LATIN SUFFIXES, AND A LIST OF PREFIXES, WITH ILLUSTRATIVE EXAMPLES. By Amos W. Currier. Philadelphia: Eldridge & Brother.

This work is prepared for those studying Latin, and is designed to teach *word-knowledge* by means of *word-formation*.

THE LOGIC OF ACCOUNTS. A new Exposition of the Theory and Practice of Double-entry Book-keeping, based on Value as being of two primary classes—Commercial and Ideal; and reducing all their exchanges to nine equations and thirteen results. By E. G. Folsom, A. M. New York and Chicago: A. L. Barnes & Co.

As will be seen from the very full title, this book may be of service to the teacher of book-keeping in suggesting new methods of instruction, but the general student will be so much the more repelled by it.

SCRIBNER'S MONTHLY.

The greatest value of this Monthly, in our eyes, is to be found in its splendidly illustrated tales of travel and adventure, and descriptions of industrial and commercial pursuits. Not that we do not appreciate, and appreciate highly, the stories, poems, essays, and reviews which are placed before us every month. These furnish the choicest reading. Especially the early chapters of Dr. Holland's *Arthur Bonnicastle* will prove a mine of suggestions and information to every teacher. But in the tales of travel and adventure, every teacher will find the readiest and most pleasant means of acquainting his pupils with the inhabitants of other countries. If we had in school less of text-book geography and more of such instruction as can be derived from "Moscow and Southern Russia," "Bangkok, in and around," A Peep at the Bird-shops," "Life in the New Diamond Diggings," "Folk-life in German Byways," and a host of other articles, a greater interest would be awakened and more lasting benefits derived from the study of geography, and a taste for more and better reading developed in the pupils. Then take up articles like "An Hour among the Greenbacks," "Our Postal Car Service," and others, and how easy will it be to give our pupils some glimpses of that active life in which they soon must take a part.

In the sixth volume, which begins with the June number, will be commenced "The Great South," under which title will be given illustrated articles descriptive of this portion of our great country. Mr. Froude will furnish a series of papers of historic interest. Bret Harte's story is in the hands of an artist, for illustration, and will shortly appear. A host of other well-known contributors is announced.

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THE

CALIFORNIA TEACHER.

AUGUST, 1873.

VOL. XI. SACRAMENTO. No. 2.

[*For the California Teacher.*]

SENSE-PERCEPTION, OR OBJECT TEACHING.

TRANSLATED FROM THE GERMAN BY MRS. LANE.

II.—NEEDS OF THE BODY.

I. FOOD.—(*a*) Food from flour: bread, cake, crackers. (*b*) Food from animals—Meat: beef from cows, pork from swine, veal from calves, lamb and mutton from sheep, venison from deer, etc. Birds: geese, ducks, chickens, pigeons, turkeys, larks, quails, etc. Fish: oysters, crabs, salmon, smelts, etc. (*c*) Food from fruits: cherries, berries (name kinds), peaches, plums, apricots, grapes, figs, pears, apples, nuts. (*d*) Food from roots: potatoes, carrots, turnips, radishes, onions, beets. (*e*) Food from leaves: salad, cabbage, parsley, etc.

Different ways of preparing food: eaten raw, viz: cucumbers, salad, fruit; cooked, viz: meat, vegetables, fruit, etc.; roasted or baked, viz: meats, fruit, etc.; smoked, meat; preserved, fish, fruit, vegetables. Rules: do not eat too much; do not drop any pieces or crumbs; divide with the hungry; feed birds. Famine.

II. DRINKS.—Kinds of drink. (*a*) According to temperature: cold, warm, hot. (*b*) According to taste: tasteless (water), sweet, sour, bitter (medicine), pleasant, unpleasant. (*c*) According to color: colorless, water; yellow, wine; white, milk; red, wine; brown, beer, coffee. What do we drink cold? warm? hot? What kinds of dishes do we drink from? cups, goblets,

glasses. Thirst, great suffering. Rules: not to drink when very warm; not to take too much strong drink. Drunkards.

III. SLEEP.—What we observe in a sleeping person: eyes closed, lies motionless, only the chest moves (why), conscious of nothing, breathes. When people sleep: at night; little children, sick people, old people: day and night. Where people sleep: in sleeping rooms, on stacks of hay, on the ground, in tents (travelers, soldiers, shepherds, etc.). Purpose of sleep: rest, strength. Rules: not sleep too long (sluggards), not have to be called twice to get up; not forget to say prayers; lay your clothes in order when you undress; say "Good night" to father, mother, and all others. Dreams.

IV. CLOTHING.—What kinds of clothing we wear; review of lessons on head, trunk, feet, etc. What people work to make our clothes: tailors, shoemakers, cloth-weavers, stocking-makers, hat, cap and glove-makers, milliners, dressmakers, seamstresses, etc. Where we get the material to make our clothes: from the vegetable kingdom, cotton, flax; from the animal kingdom: wool from sheep, fur from wild animals, hair from the goat, silk from silk-worm; from the mineral kingdom: iron, steel, brass, silver, gold. Material for cool clothing; for warm clothing; colors. Places to keep clothes: closets, wardrobes, trunks, bureaus, valises. Old clothes. Use of rags. Rules: keep clothing clean (brush, beat); keep it mended; give to the poor what you no longer need.

III.—THE CHILD AS SCHOLAR.

Where are you? in school. When do you come to school? in the morning. At what time in the morning? When do you go home? in the afternoon. At what o'clock in the afternoon? How many hours do you stay in school every day? What days of the week is there no school? Then how many days in the week is there school? What do you come to school for? to learn. To learn what? reading, writing, singing, etc. Who teaches you these? What are you, of his? Whose pupil (scholar) are you? Conclusion: every child that goes to school is a scholar. What are the scholars in the other classes? boys, girls, older, younger. How many scholars are in your class? How can we divide them? large, small; older, younger;

good, naughty; industrious, idle; neat, untidy; punctual, tardy; obedient, disobedient.

DUTIES OF THE SCHOLAR.—(*a*) At home before starting for school: get up in season; say prayers; comb hair; dress carefully; sharpen pencils; put together all the things needed to carry to school; bid "Good morning." (*b*) On the way to school: not loiter; not be noisy; not stop on the way; greet acquaintances. When to say "Good morning;" when, "Good evening;" when to take off caps. Look out for horses and teams. (*c*) Coming to school: be punctual; take seat quietly. With what to be busy: reading, writing, drawing. What not to do: make noise, jump over the seats, stand on the desks, tease others. (*d*) During lessons: sit straight, be attentive, look at the teacher, observe, answer. How: loudly, distinctly, completely. Not prompt or tell others; not be uneasy, disturb others, play, or look around the room. (*e*) Going home from school: same as going to school.

In the same way and according to the plan given under E, let the following subjects be taken up: slates; writing materials in general; slate pencils; rulers; inkstand; abacus: reading book.

IV.—THE SCHOOL ROOM.

Comparison with rooms at home: blackboards and seats; teacher's desk; place to hang clothing; stove, door, windows, ceiling, floor. Why things are placed in a certain way in the school room. Compare two children, two caps, two books, two slates; a writing book and a reading book, pencil and pen, slate and blackboard, inkstand and goblet.

HATS AND CAPS.—Purpose: protect, cover, ornament the head. Parts: rim, crown, lining. Age: new, old. What we can do with them: put on, take off, hang up, lay down, lift up, brush, clean. Where, now: on desk, in hand, etc. They cost money; they can be bought. The wind can blow them away. When the hat is to be put on; when taken off. Color, material, price, manufacture.

V. The school house. VI. Dwelling rooms: tables, chairs, sofas, bureaus, mirrors, clocks, curtains, pictures, flower-pots, vases, etc. VII. Bed, wash-table. VIII. Kitchen; fuel.

FIRE.—Where have you ever seen fire? in stove, grate, lamp, tobacco pipe, cigar, houses burning, bonfires. How is fire produced? by people rubbing together pieces of wood; by steel, stone, tinder, matches, burning-glasses; without aid of people, by lightning, etc. (*a*) Use of fire: for warming hands, clothes, rooms, dishes; for cooking food, drinks, etc.; for drying clothes, boots, etc.; for melting wax, lead, tin, iron, copper, gold; for forging iron, copper; for lighting rooms, halls, stairways, streets, public squares, clocks, lighthouses, illuminations. (*b*) Harm that fire can do: burn directly, as food when cooking; burn by the blaze of a lamp or candle; by heated objects, as water, iron, etc. We can burn our fingers, hands, feet, gums, hair. What can be burnt by fires? houses, forests, trees, ships, clothing, wood-piles. How do fires originate? without blame, by lightning; through carelessness, with hot ashes, matches, lamps, gunpowder; through wickedness, in setting fires.

IX. DWELLING HOUSES. X. OTHER HOUSES. — Comparison between dwelling houses and churches; barns and sheds for cattle, etc.

XI. COUNTY, TOWN, CITY.—Houses: different ways in which they are built; situation, surroundings; gardens; roads or streets; public buildings; inhabitants, and their occupations.

XII. CITY OR TOWN IN OR NEAR WHICH THE CHILDREN LIVE.—Name, location (mountain, valley, river, etc.), size, surroundings, parts or divisions (if any), principal streets, public parks or squares, gardens, etc. Public buildings: churches, schoolhouses, town house, city hall, court house, theaters. Inhabitants in general: general classes; poor, rich; ladies, gentlemen; well, sick; children, grown people. Inhabitants in special classes: those who furnish us with food, clothing, dwellings, table ware, furniture, amusements, health, safety, education, convenience, burial.

Occupations: further particulars in answer to three general questions, viz: what is done, what material, what tools; for example—

THE MASON.—What does he build? walls, chimneys, houses, bridges, vaults, etc. What material does he use? stone, bricks, lime, mortar, water, etc. What tools does he use? hammer, trowel, pick, plumb, level, square, etc.

DWELLINGS. — Carpenter, locksmith, glazier, roofer, painter, stone-cutter, plasterer, paper-hanger.

FOOD.—Baker, butcher, gardener, poulterer, fisherman, hunter, confectioner, cook.

CLOTHING.—Tailor, shoemaker, hatter, weaver, tanner, furrier, button-maker, milliner, seamstress.

TABLE-WARE AND FURNITURE. — Silversmiths, glass-workers, glass-blowers, glass-cutters, potters, tinmen, cabinet-makers, upholsterers.

AMUSEMENTS.—Actors, singers, dancers, rope-dancers, artists, photographers. (Of course the three questions named cannot be invariably applied.)

HEALTH.—Physician, surgeon, apothecary.

SAFETY.—Soldiers, police, night-watchmen, chimney-sweeps.

EDUCATION.—Clergy, teachers, book-sellers, librarians, authors, printers.

CONVENIENCE.—Car drivers, servants, street laborers, letter carriers, newspaper carriers, vegetable dealers, etc.

BURIAL.—Sexton, grave diggers.

A few miscellaneous subjects, selected from convenience and easy adaptation to short, concise lessons, may be found among the following:

A watch chain: material, color, links; use, to hold watch secure; where made, maker, price; what can be done with it; polished, washed, broken, fastened, loosened, lost, sold, exchanged. Kinds: (*a*) according to material: gold, silver, wire, steel, hair, silk, etc. (*b*) According to length: long, short. (*c*) According to strength: strong, thin, fine. (*d*) According to weight: light, heavy. Age: old, new. Price: dear, cheap. Other chains: wagon chains, ship chains, etc; use of each. Watch key, watch seal. Comparison of two or more chains.

A Button: form, parts, materials, color, use, maker. What changes can happen to it? What can be done with it? Where can it be sewed? Comparison of different buttons.

A ball: form (other things of same shape), color, material, fitting, use; where to be thrown; how thrown; when not to be thrown; rules; price.

A needle: kinds, color, parts; use of different parts; what is to be sewed with it? maker, price; rules: not to put in mouth;

not to pick teeth with; put away carefully; find when lost; pick up pieces when broken; (stories of injuries received from carelessness with needles). Same exercise on pins; compare needle and pin; pin has head, needle none; needle has eye, pin none; pin flexible, needle brittle; pin to make fast, needle to sew with.

A lamp: kind; different kinds; different uses; parts; material; burning material; color, maker, use; when to be lighted, when extinguished; changes; what to be done with it, what not to be done with it; illuminations; lamp manufactories; chandeliers; lanterns.

THE EARTH.—What have I here? some earth. Where else can you see earth? in flower pots, gardens, streets or roads, fields, mountains, etc. Color of earth: gray, yellowish, reddish, brown, black. Kinds: fertile, sterile; sandy, stony, clayey, limy, marshy; forest, garden, field. Names of collections of earth: clods, garden beds, furrows, mounds, banks; hills, mounds, mountains, valleys. What can be done to it? hoed, dug, sifted, heaped up, plowed, harrowed, rolled, manured (different articles used to enrich land). What does the earth produce? plants. Name some. Which grow without the labor of man? Which grow by labor of man? What does man do to cause the earth to produce plants? 1. He sows seeds in the earth. (*a*) Who? gardener, farmer, forester. (*b*) What kinds of seeds? (*aa*) The gardener sows flower seeds and vegetable seeds. (*bb*) The farmer sows wheat, corn, potatoes, etc. (*cc*) The forester, seeds of trees. When? generally in spring; also in autumn, and in some countries in winter. 2. He plants the earth; what does he plant? What does the earth need in order to be fertile? light, heat, rain, sunshine, wind, storm, cold and snow. Tools used to cultivate the earth: spades, rakes, hoes, watering pots, plows, harrows, rollers, sowing machines, reaping machines, etc.

In conclusion, I would say that the foregoing is offered as a model of the plan, rather than of the forms of expression to be used; I have aimed at brevity of phrase. Also, these exercises, intended to be oral, for the smallest children, may serve well as the groundwork for short written exercises in the higher classes.

[*For the California Teacher.*]

PRIZE ESSAY ON FROEBEL'S KINDER-GARTEN SYSTEM.

The fitting of tablets together, the fifth step in Froebel's graded system, makes the child first acquainted with superficies, in contradistinction from the solids which have till now been placed in his hands. He now learns to distinguish from each other the three principal triangles, right-angled, acute-angled, obtuse-angled; to construct the square, rectangle, rhomb, etc.; and thus becomes prepared for skillfulness in drawing within outlined squares, for which this lays the foundation. By the fitting together of the sticks, the older child — for this exercise should not be attempted before the fifth year — acquires an idea of straight lines; by the constructing of rings, of curved lines; and further, it gets an idea of the free outlining or sketching of a drawing. This is of great importance; for, in a mathematical view, there are but two kinds of lines, straight and curved. All mathematical figures are bounded either by straight lines or by curved lines. Further, by fitting the little sticks together, the child learns to perceive the numbers from one to ten, with an accurate eye. Hence the child's power of seeing and perceiving, by these two employments named, becomes sharpened in two different ways. The jointed stick, which is a succession of little sticks with the ends united, by its movability gives the child opportunity to change one mathematical figure into another; for example, a rectangle into a rhomb, a square into a parallelogram. The triangle alone cannot thus slide, as it were, into another form. By this the child learns that the triangle is a fixed figure, which cannot be changed. The cross-sticks, together with the fanciful forms of beauty which the child has the greatest pleasure in trying to represent, leads him into an important department of planimetry, namely, to polygons. With these sticks he readily constructs pentagons, hexagons, heptagons, octagons and dodecagons. In comparison with the triangles, he understands that all the polygons may be reduced or converted into triangles.

The child's impulse to activity, which has found prompt and beneficial incitement in the toys thus far introduced, grows and increases in a degree corresponding to the use made of Froebel's industrial devices, which, though never pedantic, are always

arranged according to a certain successive order. He now desires more freedom; to create for himself the surfaces and lines which, hitherto, have been placed in his hands as material objects. This can only be done by giving him drawing utensils; a slate, having its surfaces lined in squares, and next, square sheets of paper and drawing pencils, are then welcome tools to him. His hand and power of measuring with the eye having been already well exercised, he can now easily draw, from the dictation of the kinder garten teacher or from models placed before him, in the outlined squares, perpendicular, horizontal and oblique lines, unite them into angles, triangles and quadrangles, into forms of life and beauty; and, after having comprehended that the quadrangular space illustrates the proportions according to which his drawings are to be made, he learns to measure. Besides this great progress which the child makes by means of drawing, he also learns the directions of lines. He comprehends that the perpendicular line extends in a direction exactly opposite to the horizontal, and that between these there is an intermediate one, the oblique line; he comprehends that while the vertical and horizontal lines are unchangeable in direction, the oblique line can extend in numberless directions. When then, after having drawn a square or rectangle, he is directed to draw a line from one angle thereof to the opposite angle, he thus learns the line, so important in mathematics, the diagonal; and as the latter is extended, according to the lengthening of the parallelogram, he learns the different degrees of obliquity. After the child has learned to arrange together these different lines in a circular form, it becomes clear to him how similar this combination is to that of circularity, and how the latter may easily proceed from lineality. With the most forward children attempts may now be made to draw the arc and the circle in the outlined squares; this will by no means be a success with every child, since the drawing well of a curved line presumes artistic talent, while that of a straight line rests upon mechanical skill and practice.

After having already explained embroidery to be a kind of drawing with the needle, I have still to point out the mathematical principles upon which cutting out and folding, the working with peas, and the exercises with pasteboard rest, and how they influence the mental development of the child.

The legitimacy of the department of cutting out lies in the form given to the paper to be cut. This is always a square folded together three times diagonally, so as to form an eight-fold triangle. These are now cut in different patterns with two or more kinds of incisions, perpendicular, horizontal, oblique, curved and circular. The exercise of folding is arranged according to two methods, viz: the folding together of the corners, and the folding together of the sides. In the first method, by a diagonal crease the child folds his paper into a double triangle; he is then to fold the square in the second diagonal direction, and thus he forms two lines which cross at right angles in the middle of the square, which is thus formed into two triangles. The sides of the quadrilateral foundation form the bases of the triangles, which meet at their apexes. The right angle at each corner of the square is, by the crease of the fold, broken in halves, thus the angle at the basis of each triangle is half of a right angle, and the sum of the three angles of the triangle is equal to two right angles. In this act, these mathematical principles fall, as it were, directly into the hands of the child. In the second method of folding, the square is formed first into a double rectangle, and then into four smaller squares. In the former of these foldings, also, are developed mathematical principles; for instance, all the angles of a square and of a rectangle are right angles, hence they are equal; etc.

The exercises with peas, as well as those with pasteboard, presuppose an already acquired intimate acquaintance with mathematical principles, since, without that, even with the necessary materials and implements, as knife, scissors, metallic ruler, compass and square, exercises of this kind will not succeed. Hence these two are especially adapted to the older pupils of the kinder-garten. At the age of seven years, however, children who have attended the kinder-garten from the third year, possess the necessary knowledge for the work in question. By the exercises with pasteboard and with peas, by the representation of forms of every-day life, by the construction of stereometrical bodies, as the pyramid, cube, prism, cylinder and sphere, their mathematical perceptions are brought to still greater perfection. With the formal accomplishment of this, added to attempts at modeling, the final standpoint of the kinder-garten is reached.

Modeling, of which exercise the primary elementary forms of the crystal (the octohedron, hexahedron, rhombic dodecahedron, etc.) form the foundation, is, according to Froebel's plan, the keystone, both of his educational expedients and his amusements. From the first gift to cutting out, the child advances by *separating* from body to point; from embroidering to modeling he advances by *joining together*, from point to body again.

Having spoken of the effects of Froebel's system of education based upon mathematical principles, upon the pupils of the kinder-garten, allow me to speak upon the influences to be expected upon the subsequent schools.

III. As already mentioned in the introductory remarks of this lecture, Froebel gives to active amusements and bodily exercises the preference before all other industrial expedients. He leads his pupils into a *garden*, shows them there the different kinds of grain, awakens their sensibilities to the world of flowers, makes them themselves sow and plant, weed and water, and cultivate their beds with rake and spade. To make them acquainted also with wood and field, mountain and valley, river and brook, he takes them into the open country, and, watched by careful guardians, allows them to make short rambles. Singing, the child's delight, is a constant accompaniment to these excursions; also the telling of stories, the viewing and explanation of pictures, are to be closely connected with their amusements and occupations, since the latter often require the aid of pictures and narration to make them complete. Such educational expedients, as adapted to his institution by Froebel, exert the widest and most beneficial influence upon the subsequent school.

A mentally and bodily healthy child, who, systematically withdrawn from amusements which formerly led only too often to rudeness and coarseness, has made sensible acquaintance with nature and the habitable earth, and who, in the cultivation of his garden, learns best to anticipate a higher Providence, to feel the relation of his dependence upon God—such a child will certainly be a most desirable member of our common school. A teacher may weary himself, and that in vain, in endeavoring to impart to a child, even to one who has enjoyed a large share of the freedom of country life, an idea of the beauty of nature;

and this, because the child has heretofore remained insensible to the world around him, because by its intercourse with other uncultured children it inclines to rudeness, or because acquainted only with a faulty training which knows how to maintain its authority only by the rod; and thus it is already on the road of becoming a dangerous member of human society. It is then not to be questioned that a pupil of the kinder-garten will become a more teachable, a more properly behaved, better educated, and in neatness and propriety better fitted scholar for the subsequent school, than the child who has not had the good fortune to enjoy the kinder-garten discipline.

If, as scientific investigation asserts, the human brain does not reach its complete development before the seventh year of life, it is evidently a wrong which cries to heaven, to torment a child with the learning, before this time, of the elements of school instruction. Perhaps later generations will become convinced of this; at present the sixth year is fixed upon as the commencement of the school course. This misfortune is to be remedied by but one course, viz: by making the subjects of elementary instruction as comprehensible and easy to the child as possible. To the question, Does the kinder-garten prepare its pupils for this easy comprehension? we can, with a good conscience, reply, *Yes.*

Let us first consider writing. Writing is drawing with straight and curved lines. This Froebel most clearly perceived, and hence he first gives the children the longitudinal tablets, in order that, together with their mathematical import, their eyes may be accustomed to straight lines. The same relation holds with the gift of the small sticks and rings to be fitted to each other, by which the child learns to distinguish the straight lines from the curved ones. Then follow systematic exercises on the slate or in the drawing book, as described by aid of the squares into which the surface of paper or slate is marked off. According to direction, the child draws within the square, vertical or horizontal lines; uniting these by oblique lines, he has already become quite familiar with such letters as *i*, *n*, *m*, *u*, etc., on entering the common school. What a gain for the latter, when it can receive a large number of pupils whose eye is already trained to distinguish the direction of lines, whose hand is able

to keep within prescribed limits. There is no doubt that a child thus previously fitted for the common school will learn to read easier than one who has never attempted drawing within fixed lines; the former has a keener perception of the different letters, syllables and separate words, than the latter.

Concerning reckoning with numbers, therein, too, is the kinder-garten an excellent preparatory institution for the common school. In this lecture I have especially noticed those gifts and industrial expedients by which the child is led to count, and is exercised therein without being formally taught. I would further remark that the kinder-garten exercise of braiding or plaiting is peculiarly adapted to the easy acquisition by the child of a knowledge of numbers. In plaiting the child is obliged to keep counting, for in everything of the kind the work goes wrong as soon as he ceases to count. Counting is the foundation of all reckoning with numbers; hence, in plaiting, besides many other advantages, there is one of great importance, viz: that of the clearest perception of numbers, and hence it would be very desirable if this occupation, as well as that of drawing within fixed squares, could be introduced into the common school.

It is easily perceived that in natural history and in a knowledge of the vegetable kingdom, a well organized kinder-garten is an excellent preparatory department to the common school, since the child's perceptive faculties and his imagination are continually developed by being shown pictures of objects from every kingdom of nature. In the same manner, the child's mathematical knowledge of the ball, cylinder and cube, of their various motions, their three axes, their rotations, their simple and double revolutions, etc., is of the greatest advantage in the subsequent school, in instruction in a knowledge of the earth.

Still further, to prove the influence of the kinder-garten upon the religious culture of the child, I would mention the short but frequent allusions to God that are to be made in considering His works; that each day's exercises may be begun with the singing of some little hymn, or child's prayer. Such general exercises of praise and prayer elevate the child's frame of mind, whether he be older or younger, to devotion, piety and gratitude to God, while from his yet uncorrupted heart flows a childish petition for the fatherly care of the All-good Creator.

MRS. LANE.

[*For the California Teacher.*]

INSTRUCTIONS REGARDING THE COURSE OF STUDIES.

I.—For the convenience of grading the schools, the course of studies is divided into three grades, and each grade into several divisions. But teachers will find it more practicable in the school room to call each division a grade or class; thus a school in which all three grades and every one of their divisions is represented, will have eight grades or classes; and instead of calling a class the second division of the second grade, it will be more convenient to call it the fourth grade or class.

The object of the course of studies is to prescribe the topics which are to be taught in the public schools of California. At the beginning of a school year, or school term, the teacher must assign every pupil to his or her division, and in that division the pupil must stay during the school year or term. The studies prescribed for the division to which a pupil belongs, must be *all* strictly pursued, and *none other*. Under no consideration is it to be allowed that a child read with this division, study arithmetic with another division, and perhaps geography or grammar with a third division. The pupils of most of our country schools have been permitted to push ahead of their classmates in some studies and fall behind in others. This can no longer be permitted. In whatever class a child is placed at the beginning of the term, with that class it must continue to the end of the term. Every pupil must pursue *all* the studies prescribed for his division. Many teachers, either through incapacity or neglect, or at the child's or parent's request, have heretofore omitted some of the studies. This has been especially the case with oral instruction and object lessons. This, also, can no longer be tolerated. All the work laid down must be gone through with.

It has been customary with many teachers to re-grade or re-classify the school every month or two. Every school must be graded at the beginning of the term, and no re-grading or re-classifying is allowed until the end of the term, whether this be short or long, of five, eight or ten months' duration. In order to meet the wants of all schools, five months have been considered the minimum length of school terms; and the course of studies gives the *maximum* work for a five months' school, in

which every division is represented. On the other hand, the course gives the *minimum* work for schools which are maintained more than five months, or taught by more than one teacher. In the latter case, the different topics can be more elaborately taught, more frequently reviewed, than in the former case. Teachers will find, that though a five months' term is long enough to go through with all the work laid down, yet an eight or ten months' term will be not too long for the work. Let the pupils finish the work of one division during a school year, but do not push them, in a year, through two or three divisions.

II. GRADING AND CLASSIFYING OF SCHOOLS. — According to Section Sixteen hundred and sixty-three of the Political Code, each County Superintendent must, under instruction from the State Board of Education, determine the respective grade or class of the schools of his county. All schools, unless otherwise provided by special statute, must be divided into first, second and third grade. The State Board of Education have issued the following instruction: "Schools in which the studies of the third grade are taught exclusively, shall be of the third grade; schools in which no studies more advanced than those of the second grade are taught, shall be of the second grade; schools in which studies more advanced than those of the second grade are taught shall be of the first grade." County Superintendents can thus easily grade the schools of their respective counties. If the first division or any lower division of the third grade is the most advanced class, the school is of the third grade; if any scholars are in the first or second division of the second grade, the school is of the second grade; if any scholars are in the first or second division of the first grade, or of the advanced grade, the school is of the first grade. Hence, to determine the grade of a school, the most advanced class in the school need only to be examined, and its standing will determine the grade of the school.

But County Superintendents must also determine whether the teacher is instructing the school according to the course of studies. As each class in the school represents, must represent, a division of the course of studies, the County Superintendent can see from the course of studies what studies each class must be pursuing; and a few leading questions in each study will

satisfy the County Superintendent concerning the thoroughness of the teacher's work. In some future number of the CALIFORNIA TEACHER, more specific directions will be given.

The classifying of the school must usually be left to the teacher. This must not be confounded with the grading of the school. The grading, which *must* be done by the County Superintendent, determines to which division of the course of studies the most advanced class of the school belongs. The classifying of the school places each pupil in his appropriate division. This ought to be left to the teacher; though County Superintendents and Trustees can in many cases render valuable service. But should a County Superintendent find that a teacher neglects or refuses to classify his school *strictly* according to the course of studies, it becomes the Superintendent's duty to classify the school, and the teacher or trustees will have then no power to alter the classification until the close of the term of school.

As many schools are not yet properly classified, the following suggestions may be of service to teachers.

For reasons which will be explained in the proper place, the readers have been made the principal textbooks in teaching—besides reading—spelling, grammar and composition. In these studies, the advancement which is made or can be made, or the place where a scholar must begin their study, will be determined by his advancement or place in reading. At the same time, the studying of geography, history, etc., by the help of textbooks, will depend altogether upon the pupil's proficiency in reading. It is plain, therefore, that the reader which a child is using will determine also the geography, etc., which a child can study. Under proper instruction, the child's progress in spelling and the other studies will keep pace with his progress in reading, and *vice versa*. Hence it will be a very safe rule to classify and advance pupils according to their proficiency in reading.

We have purposely left the consideration of arithmetic to the last. In this study it may be advisable to allow some deviation from a strict adherence to the classification of the course of studies; at least so far that, in arithmetic, a pupil may be allowed, according to his "mathematical capacity," to study with a lower or higher division than the one he properly belongs to, in reading, grammar, geography, etc.

After a school is properly classified, every pupil must stay during the term in the division in which he was placed at the beginning of the term. Much valuable time is lost by the constant re-grading of schools, so common in some counties. One County Superintendent, at least, talked about the necessity of re-grading the schools of his county at least four times during the year. As stated above, the course of studies provides work enough for a ten months' term. One of the first requisites to successful instruction is systematic instruction. The work of one division continues the work of the lower division, and prepares for the work of the next higher division; and except the work of each division be done fully and thoroughly, no advancement can be made.

At the close of every term, an examination must be held. This may be oral, or written, or both. Written examination will give more satisfactory results than oral examination. A certain number of questions, say ten, should be selected in every study—except in spelling, in which at least twenty-five words should be given out—and answered by the pupils. No pupil must be allowed to advance on an average percentage of less than seventy per cent. The examination should be conducted by some person or persons other than the teacher. The County Superintendent, or Trustees, or a committee appointed by them, should examine the school. All pupils who reach seventy per cent. or more, are advanced to the next higher division; all who fall below seventy per cent. must stay another term in the division in which they have been during the last term. At the close of the examination the teacher should specify on the register the division to which each pupil has thus been found to belong, so that at the beginning of the next term no question can arise as to which division each pupil belongs, and no time be lost in classifying.

III. METHODS OF TEACHING.—Outlines of methods of teaching are laid down for the different branches, especially for oral instruction. It is necessary that teachers follow these outlines, but the details of instruction are left to the tact and skill of the individual teacher. For instance, whilst in instructing the fourth division of the third grade in arithmetic, it is incumbent upon the teacher to instruct the pupils by taking first the num-

ber two, then the number three, then four, and so on, counting as far as each, adding, subtracting, multiplying and dividing each, in every way possible without using any figure not yet reached; and whilst every one of these steps must be illustrated by the objects which the pupil sees about him, the work in full for every number is left to each individual teacher. The course of studies defines only the *results* which are to be reached. Thus, for the second division of the third grade, the results of teaching must be that every pupil, after completing the work of the division, can read anywhere in McGuffey's Second Reader; can spell every word occurring in the Reader; has learned the elements and principles of script letters; can notate and numerate all integers to one thousand; can add, subtract, multiply and divide numbers within one hundred, etc.

[*For the California Teacher.*]

PRIMARY DRAWING LESSONS.

I. A TALK TO CHILDREN ABOUT DRAWING — THE TEACHER'S PREFACE TO THE LESSON.— How many of you would like to learn to draw? It is not only a beautiful but a very useful art; I will name some of the uses. Nearly every thing that is made is first planned in the mind, then drawn: dwelling houses, school houses, churches, and all public buildings are made after a plan drawn in the most accurate manner. The furniture of our buildings — chairs, tables, bureaus, wardrobes, clocks, lamps, mantel ornaments, our crockery and cutlery, are all first designed, then drawn; and after this pattern are made or moulded, according to the material used. I will tell you a true story. A hardware merchant once called on an artist to know if he could design a new and improved pattern for table knives and forks. The artist spent about an hour in making a sketch, and the gentleman inquired what he should pay. "Oh! nothing," said the artist, "it's but a trifle." "But," said the merchant, "I expect to make money out of it, and wish to pay you for your work." "Very well, then, give me twenty-five dollars." Some time after, a check for fifty more was received; the improvement had been so popular and profitable, the merchant

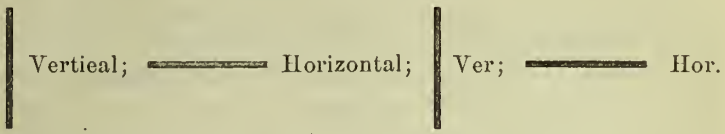
thought the artist was not sufficiently paid. So, for one hour's work he received seventy five dollars.

The patterns of the carpets on our floors, the figures on our wall paper and calicoes, are all designed and drawn out by artist workmen, who stand first in our manufactories, both in pay and position. All machinery has first to be drawn. The sciences, too, call for the assistance of the draughtsman; treatises on many of them would be utterly incomprehensible without the illustrations that the artist alone can give. The professions, also, are equally indebted to this art. What would the doctor do, without his anatomical drawings? and not unfrequently is he called upon to note, in this way, new and strange phases of disease. Our books, magazines, newspapers, are full of the work of the artist. During the last political campaign it is said that the great caricaturist, Nast, was paid five hundred dollars weekly, for his comical illustrations. Other artists engaged in a similar way are making ten thousand dollars a year. Is it not well, then, to know how to draw? But money is not all that it brings; by the habit of attention acquired you will see more beauty of form, brilliancy of color, and loveliness everywhere, than you ever would have noticed without the practice of this art.

QUES.—Why is it useful to learn to draw? Mention some of the things that you see, which you think were drawn before they were made. In what trades is drawing useful? In what professions? What habit does it cultivate that will be of advantage to you in all other things?

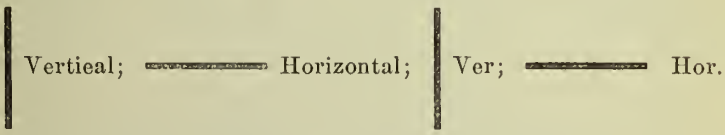
II. AN EXERCISE TO PRECEDE THE LESSON IN DRAWING.—(*Obs.* Each pupil should be furnished with two sticks—penholders, without the pens, will answer; the teacher can use a blackboard-pointer.) Holding up the chalk box, the teacher will remark: "The edges of this box take different directions; this runs across—that down. The names of these directions are the first things to be learned." Passing the finger along the top of the box, you will say: "This is horizontal;" then down by the side—"This is vertical." Setting the box down, take the stick in the right hand, and placing the lower end upon the desk, say: "This is vertical;" turning it to the left till it is level—"This is horizontal." The pupil will now take a stick

in the right hand and repeat with the teacher, being sure to hold the stick in the direction indicated:



Obs. The number of times this and other lessons should be repeated, depends entirely upon the ability of the class. Pass to other lessons as soon as the words are well pronounced and the idea fully comprehended.

The teacher will now take the stick in the left hand, the children also, and repeat as before:



Enquire what lines in the room are vertical? *Ans.* Sides of the doors, windows, walls, stove pipe, maps, etc. (*Obs.* The teacher will not suggest unless the pupils fail to see them.) What lines are horizontal? *Ans.* Lines of floors, ceilings, top and bottom of blackboards, window sashes, etc.

The teacher and pupils will now take a stick in each hand.

The teacher, holding up one in the right hand, will say: "The right vertical;" pupils do the same. Raising the other, in the left hand, on a level, say: "The left vertical." *Mem.* The pupils will follow in all respects.

Turn the sticks towards the left, the thumbs of the right and

left hands being directly over each other.

Repeat: "Both horizontal."

Now holding the sticks vertical and near each other, the tops on a level, say: "These lines take the same direction, they are in all parts at an equal distance from each other; they are, therefore, parallel lines. To fully describe them, they are *straight*, *vertical*, and *parallel*.

Obs. The pupils will always repeat the descriptions after the teacher.

Raise the right stick higher than the left, keeping them both vertical.

Ques. Are they still parallel? *Ans.* They are; they still take the same direction.

Turn the sticks in a horizontal direction, and bring them near each other. Now describe them fully.

Ans. They are straight, horizontal, and parallel.

Move the right hand farther to the right, keeping a horizontal direction. Are the lines still parallel?

Ans. Still parallel.

Illustrate by the chalk-box. The top lines are horizontal; the side lines are vertical; the top and bottom lines are *parallel horizontals;* the side lines are *parallel verticals.*

Take hold of the stick in the *right* hand at the lower end, and raise it vertically; then taking the other in the *left* hand, and holding it horizontally, bring it to the lower end of the vertical. These two lines now form a right angle.

Def. An angle is a space between two lines that take different directions. Illustrate by the chalk-box. The corners are right angles. How many right angles on one side? *Ans.* Four. How many sides has the box? *Ans.* Six. How many right angles are contained in the chalk-box? *Ans.* Twenty-four.

Now carry the *left* hand stick to the top of the vertical. This is also a right angle.

Carry the left hand stick down to the middle of the vertical.

What are these angles? *Ans.* Right angles. How many right angles? *Ans.* Two.

Obs. The horizontal meets the vertical at right angles. The children will repeat this after the teacher.

Keeping the stick in the left hand in a horizontal position, touch the middle with the right hand stick, held vertically. How many right angles have you? *Ans.* Two. Describe them. *Ans.* The vertical touches the horizontal at right angles. What right angles do you see in this room? *Ans.* Corners of the room, doors, windows, black-boards, etc. Besides the corners of the doors, where else are there right angles in the doors? *Ans.* In the panels. How many? *Ans.* Sixteen. The teacher is not to answer the questions, unless the pupils fail to discover them.

Cross the sticks at the middle of each. How many right angles have you? Describe.

Ans. The vertical crosses the horizontal at right angles, and four right angles are formed.

From the Popular Science Monthly.

SCIENTIFIC NORMAL SCHOOLS.

The idea suggested by this title has long been with many a matter of vague and distant anticipation; but there is promise that something of the kind may soon become a realized fact. Rather, perhaps, we are to have a high-class Teachers' Institute on a strictly scientific basis. Professor Agassiz is expected to open, next summer, a school of Natural History for the benefit of teachers during their vacation. He has associated with him twenty professors of high character to carry out the plan, and the object is to afford ample facilities for studying specimens and becoming familiar with the actual properties and relations of living things. In an address before a committee of the Massachusetts Legislature on the claims of the Cambridge Museum of Comparative Zoology, Prof. Agassiz explained the nature and purpose of the contemplated project, which is kindred to the object for which the museum itself was founded. Education must have its storehouses of implements. For philosophy, history and literature, public libraries are established, because these subjects are to be studied by means of books. But in

science, books are not sufficient; specimens are indispensable. We want, said Prof. Agassiz, to educate men who shall be able to read Nature, and this can only be done by studious familiarity with natural objects. The school is to carry out this plan. Nantucket Island has been selected as the location, and provision is made for a very thorough and comprehensive course of instruction.

This idea is certainly capable of extension, and the time, we think, has come when it should be taken up and carried out in different parts of the country. The Nantucket scheme could not be copied in the interior, because one half of its subjects pertain to the natural history of the sea. The scheme is constructed from Prof. Agassiz's point of view, and is devoted mainly to zoology. The botany of land plants is not included; entomology gets but little attention, and physics none at all. This is not intimated as a deficiency of the programme, which is sufficiently broad, and lays out more work than there will be time to do it in. It is evidently designed for the advantage of professors and teachers of science in educational institutions who already know something of the subjects, and desire the opportunity of perfecting their knowledge of natural history under the ablest instructors.

But the time has come for entering upon similar arrangements in behalf of the multitude of teachers in our common schools. We have normal schools for their preparation, but they are fashioned upon the old academic and collegiate pattern, and furnish only a book-education. The little science they pretend to give is book science, and not the knowledge of things. Throughout nearly all of the common schools of the country, physics, chemistry, botany, and zoology are taught, if taught at all, by the same method as history or Latin — that is, by committing and reciting lessons from books. It is universally admitted that this is absurd, but what to do about it is the difficulty. The system is self-perpetuating. The normal schools go on in the old ruts, and continue to furnish teachers of the old type. Higher standards of attainment may be exacted in the routine branches, and there is unquestionably some improvement in methods; but little is done to bring the minds of pupils into familiar relations with Nature. Scarcely anything is done

for the thorough cultivation of the observing powers by exercising them upon objects and experiments. In response to the demand for studying Nature, we have only the rude expedient of object-lessons for children, administered by teachers who know nothing of physical science on the one hand, nor the science of the growing mind on the other.

What we want in every State in the Union is what Prof. Agassiz is preparing to supply in Massachusetts, an opportunity for teachers to come together, where there are cabinets, laboratories, specimens and experiments, and an able corps of instructors who are at home with all these resources, and can teach directly from Nature herself. If the vacation-weeks only are to be devoted to this work, the scheme of studies will require to be drawn up with strict reference to their urgent and practical requirements. Nantucket will be favorable for studying the zoological productions of the sea; but Nature is an inexhaustible museum, and every place abounds with the material for the illustration of scientific study. The air, the fields, the woods, and the streams, swarm with life; the rocks are uncovered, minerals abound; the earth is carpeted with vegetation, the forces of nature are ever playing around us, while every family, school, church, factory, poor house, jail, neighborhood and village, affords materials for the scientific study of social phenomena and laws. What is needed is, to teach teachers to bring their minds to bear directly upon those things, to observe, compare, and analyze them, so that their knowledge may be real, positive, and worthy the name of science. It may not be easy to found a proper curriculum for a scientific Teachers' Institute, selecting just the proper subjects, and assigning them their due proportions; yet the work is entirely practicable, and experience would soon fix the adjustments. As a preliminary step to such a movement, nothing could be better than a national convention of teachers, professors and school superintendents, called for the distinctive purpose of laying down the plan and organizing the means for the promotion of scientific education. Prof. Agassiz has broken the ice, and will show us what it is possible to do in this direction during a single vacation. His enterprise is a national movement, and at once raises the important question as to how similar advantages may be gained for the general education of the country.

[Since the above article was put into type, Prof. Agassiz has been presented with an island as a location for his school, and a $50,000 endowment to assist in defraying its expenses. The donor is Mr. John Anderson of New York, and the island of 100 acres, known as Penikese, is one of the Elizabeth group, near New Bedford, four miles from the main land, and twenty-four miles from Newport.]

DEPARTMENT OF PUBLIC INSTRUCTION.

A NEW EDITION of the School Law has been printed and distributed to County Superintendents. Enough copies have been sent to supply each district and each teacher with a copy. County Superintendents will please bear in mind that the School Law is published for the use of trustees and teachers *only*.

COUNTY SUPERINTENDENTS are once more reminded that their reports must be on file in this office on or before the 20th of August. No extension of time can be granted. Reports must be sent either by Wells, Fargo & Company's Express or by mail, full letter postage, prepaid, *i. e.* three cents for every half an ounce or fraction.

WE CALL the attention of County Superintendents to a resolution of the State Board of Education, whereby County Superintendents are requested to report to the State Board of Education, on or before the first of August, any errors or defects in the School Law which may come under their notice. A similar request has been made in the blanks for reports.

AS WILL be seen from the proceedings of the State Board of Education at its last meeting, the introduction of the revised course of studies adopted February 13th, 1873, is not made obligatory until January first, 1874. Until that time teachers may, if they choose, follow the course of studies adopted September 29th, 1870, and published in the CALIFORNIA TEACHER for January, 1871. One of these two courses every teacher *must* follow; the law that every teacher in the public schools must enforce the course of studies prescribed by the State Board of Education, is of more than seven years' standing. The revised course will, on trial, be found to be far less cumbersome and difficult of execution than the old course; and teachers are urged to follow the revised course whenever and as quickly as practicable. Those who have not the old course at hand, will of course have to adopt the revised course. Pasteboard cards, on which are printed the rules and regulations and the revised course of instruction, are in course of preparation, and will soon be supplied through County Superintendents.

OUR ATTENTION has been repeatedly drawn to the subject of grading schools. As far back as 1866, the public schools were required to be graded. The word "Graded" appears to be a stumbling-block in the way of many teachers and County Superintendents. Teachers, in reporting to the County Superintendent, instead of stating the grade of their school, persist in calling it ungraded, or mixed. The word *grade*, within the meaning of the School Law, simply determines the highest studies taught in the school; and according to the instructions issued by the State Board of Education September 20th, 1870, "where all the studies of the course are taught, or those mentioned in the first grade, the school shall be deemed of the first grade, and a teacher must have a first grade State or County certificate in full force, or a State Life, or State Educational Diploma, to be competent to teach such school. Where no higher studies are taught than those mentioned in the course of studies for a second grade

school, the teacher must have at least a second grade State or County certificate, to enable him or her to teach such school. Where there are no higher studies taught than those mentioned in the course of studies for a third grade school, a teacher holding a third grade State or County certificate will be deemed competent to teach such school." The State Board, at its meeting held February 17th, 1873, adopted, in substance, the same rule for grading; but does not base the grading on the studies taught to a large majority of the pupils of the district, as required by the State Board in 1870, but lets the standing of the first division of the school determine the grade of the school. In another part of this number of the TEACHER, we have more fully entered into the subject of grading. (See the long primer article "Instructions regarding the Course of Studies.") It will be evident that, in accordance with the above quoted instructions of the State Board of Education, every teacher not reporting the grade of the school taught by him, but simply classing it as ungraded or mixed, is teaching in blissful ignorance or oblivion of the first requirements of the School Law, and is not entitled to any salary out of the public school fund.

WE ARE glad to note that some County Superintendents are taking hold in earnest and insist and see that teachers follow the course of studies prescribed by the State Board of Education. Whenever a County Superintendent has taken hold of the subject in downright earnest, he has succeeded beyond expectation; and the improved condition of his schools has amply testified to the efficiency and necessity of a course of studies. Mr. S. H. Jackman, of Sacramento County, has by hard and persistent labor succeeded in doing what we thought to be an impossibility, namely, brought every teacher in his county to teach exactly according to the requirements of the course of studies adopted September 29th, 1870. There is not a pupil in the whole county, outside of the cities, but he knows to which division he belongs, and that he pursues all the studies, and none other than those, laid down for his division, and that he will not enter into the next higher division except upon a certificate of promotion granted by the County Superintendent. If a teacher does not follow the course of studies in every particular, his salary is withheld. It is plain, then, that what Mr. Jackman has been able to do in one of the most populous counties of the State, and with so cumbersome a course of studies as that of 1870, can certainly be done in every county of this State, and with a course of studies which materially lessens and lightens the labors of pupils and teachers. It is simply because many teachers and County Superintendents have never had the will, that they have found no way of teaching according to a systematic course of studies.

ACCORDING to a resolution adopted at the last meeting of the State Board of Education, the *Manual* to accompany the course of studies will not be published until January first, 1874.

WE HAVE been questioned concerning the manner of collecting delinquent district school taxes. Section eighteen hundred and thirty-eight of the Political Code provides that these delinquent taxes must be collected in the same manner as delinquent State and county taxes. Instead of quoting in full the different sections of the Political Code which refer to the collection of delinquent State and county taxes, it will be perhaps of greater service to trustees if we simply apply their provisions as succinctly as possible to the collection of delinquent district school taxes. Within sixty days after the trustees have placed the tax list in the hands of the collector, the latter must

return the roll to the trustees, with the word "Paid" marked opposite the name of each person or description of property from whom or on which he has received the tax; and he must also, at the same time, file with the trustees the County Treasurer's receipt for all the moneys by him collected; and the persons and property on the roll not by the collector marked "Paid" are delinquent. After settlement with the collector, the trustees must charge the collector with the amount of taxes due on the delinquent tax list, with five per cent. added thereto, and within three days thereafter deliver the list, duly certified, to such collector. The collector having, before beginning to collect, or while collecting the taxes, published a notice when taxes will become delinquent, and that unless paid prior thereto five per cent. will be added to the amount thereof, must publish the delinquent list, which must contain the names of the persons, and the amount of taxes and costs due, opposite each name. The tax collector must append and publish with the delinquent tax list a notice that unless the taxes delinquent, together with the costs and percentage, are paid, the property upon which such taxes are a lien will be sold at public auction. The publication must be made once a week for three successive weeks, in some newspaper, or supplement thereto, published in the county; or if there is none, then by posting a copy of the list in three public places in the district. The publication must designate the time and place of sale, which must not be less than twenty-one nor more than twenty-eight days from the first publication, and the place must be in front of the County Court House. The collector, as soon as he has made the publication required, must file with the County Recorder and County Clerk respectively, a copy of the publication, with an affidavit attached thereto that it is a true copy of the same; that the publication was made in a newspaper or supplement thereto, stating its name and place of publication, and the date of each appearance; and in case there was no newspaper published in his county, that notices were put up in three public places, designating the places therein, which affidavit is primary evidence of all the facts stated therein. The collector must collect, in addition to the taxes due on the delinquent list, and five per cent. added thereto, fifty cents on each lot, piece, or tract of land separately assessed, and on each assessment of personal property, one half of which must go to the district and the other to the collector in full for preparing the list. On the day fixed for the sale, or on some subsequent day to which he may have postponed it, of which he must give notice, the collector, between the hours of ten o'clock A. M. and three P. M., must commence the sale of the property advertised, commencing at the head of the list, and continuing alphabetically or in the numerical order of lots and blocks until completed.

For particulars in regard to certificate of sale, redemption of property, etc., see section 3777, *et seq.*, of the Political Code.

TEACHERS' INSTITUTES have been held in Los Angeles, Lake, and Mendocino Counties. The exercises and lectures were of the usual order. In Los Angeles County, a resolution favoring compulsory education was passed.

THE STATE BOARD OF EDUCATION

Met at the office of Superintendent of Public Instruction, June 21st, 1873, at 10:30 A.M.

Present—Governor Booth, Messrs. Widber, Jones, Lynch, Baker, and Bolander.

Absent—Messrs. Leadbetter and Jackman, and Dr. Lucky.

The minutes of the meeting of February 17th, 1873, were read and approved.

Superintendent Bolander stated that the meeting had been called for the purpose of again considering the question of providing a standard for grading the schools of the State. To bring the matter before the Board, he moved a reconsideration of the resolution upon the subject adopted at the last meeting. After considerable discussion, on motion of Mr. Lynch, the enforcement of the method of grading adopted at the meeting held February 17th, 1873, was postponed until January 1st, 1874.

On motion of Superintendent Bolander, the putting into effect of the course of studies adopted by the Board at its last meeting, was likewise postponed until January 1st, 1874. The effect of these postponements will be to continue the grading of the schools and the course of studies as at present, until the date named.

On motion of Superintendent Bolander, a committee was appointed to consider the subject of text books for drawing. Messrs. Bolander, Widber, and Baker were appointed such committee.

On motion of Superintendent Bolander, the County Superintendents of the State were requested to report to this Board, on or before the first of August, any errors or defects in the school law which may come under their notice.

On motion, the course of studies was referred back to the committee on that subject.

On recommendation of the State Board of Examination, a life diploma was granted to Geo. F. Baker, of Santa Clara County.

The life diploma heretofore issued to Joseph Leggett having been lost, a duplicate was granted.

On motion, County Boards of Examination were instructed not to issue teachers' certificates to applicants under eighteen years of age.

On motion, County Boards of Examination were instructed not to renew third grade certificates.

On motion of Mr. Baker, the State Superintendent was directed to have printed an edition of the School Law, sufficiently large to supply every Trustee in the State with a copy, and an edition of five thousand copies was ordered.

On motion of Mr. Jones, a committee to revise the rules and regulations for the government of schools was appointed. Messrs. Jones, Bolander, and Lynch were designated as such committee.

On motion, the Board adjourned, to meet at the call of the Secretary.

EDUCATIONAL ITEMS.

RHODE ISLAND EDUCATIONAL UNION.—The fifth annual meeting of this association was held on Thursday evening, March 20th, at the Franklin Society rooms. The agent, Mr. Samuel Austin, presented his annual report, from which we make the following extract, as showing in a succinct form the extent and comparative value of the earnest and indefatigable labors of this old and tried friend of common school education: "There have already been opened in more than twenty towns upwards of sixty evening schools, averaging at least one hundred scholars each. During the past year, the towns of Warwick and Cumberland have appropriated $500 and $600 respectively, for the establishment of this class of schools, affording instruction to upwards of eight hundred pupils. The localities thus provided for are Ashton, East Lonsdale, Valley Falls, Phenix, Apponang, Natick, Pontiac, and Compton. In several other places, as East Providence and East Greenwich, schools have for the first time been opened, and are deeply enlisting the interests of those communities. The large

and well ordered school at Cranston Point Works, numbering at times more than two hundred and fifty attendants, with a corps of ten earnest teachers and the ready serving of an efficient superintendent, has from the first been liberally accommodated, supplied, and maintained wholly by the local proprietors. The proprietors at the mills at Bernon and Globe villages, upon suggestion, readily opened two excellent schools. The same course has been pursued by the liberal proprietor of the mills at Slatersville. Warren and Bristol have each two good schools in active operation. The village of Peace Dale has its evening school, leaving scarcely any demand for educational facilities in that immediate vicinity unsupplied. The elementary Polytechnic school in Providence, though in its infancy, it cannot be doubted, contains the germ of an institution which, directly and by example, is to exert a marked influence upon our industrial and social progress. It is a fact of interest in this connection, that upwards of $32,000 have been appropriated in this State for the support of evening schools since the active operations of the Union commenced, $8,000 coming from mill proprietors and corporations. In this sum, what has been expended in Providence and Newport is not included. If to this $32,000 is added the value of rents, desks, fixtures, heating and lighting, apparatus, voluntary work, and an average expenditure of two dollars each season on the part of each scholar for books, stationery, etc., and the amount expended for evening schools up to the present time is swelled to about $75,000."

WELL-MERITED REBUKE.—Among the evils growing out of the semi-political character of our county superintendency, is the ease with which "opposition" is worked up against a good officer. So good is this opportunity, that I think no well qualified man can do his full duty without knowing before he begins that the *opposition* will commence work nearly as soon as he does. The opposition to the good man is always from the bad men—the opposition to the good Superintendent is always from those who desire lower standards of qualifications, less effective management, and poorer methods of instruction. On the ground of qualifications, all work into the opposition who do not obtain certificates. In some instances, this is the Superintendent's greatest sin—he will not give Lucy Brown a certificate, Lucy Brown representing the totally *un*-qualified persons who apply. In several instances very excellent Superintendents have failed of re-election for this sole cause. Superintendent Martz, of Greenwood County, has hushed that kind of opposition in his county by publishing his questions, the number of applicants, the number of correct answers to each question, and the number of certificates given; also stating, that of the twenty applicants, twelve were teachers, and eight were children in a certain school in the county. His report further shows that six of the twelve teachers failed, while only one of the children was thus humiliated. Of the six teachers receiving certificates, one received a first grade, two second, and three third grade. Of the school-children who passed the examination, three were entitled to second grade and four to third grade certificates. Of the affair, the Eureka *Herald* says: "The compliment to Miss Claycomb is well merited. The reason why the Board did not issue certificates to Miss Claycomb's pupils is, that they are too young to take charge of a school. They have put to shame some of the old teachers by their excellent scholarship. It is to be hoped that those who have been grumbling about the severity of the examinations, will see the propriety of keeping still till they can beat a class of school-children."—*Kansas Educational Journal.*

NEW YORK has eight Normal Schools in full blast, and in the City, the Normal School for ladies has one thousand pupils fitting themselves for teachers. Pennsylvania has seven, Massachusetts four, and Maryland four.

BOOK NOTICES.

New American Series of Readers and Spellers. By Epes Sargent and Amasa May. Philadelphia: E. H. Butler & Co.

This series of Readers and Spellers was already noticed in the Teacher for August, 1872.

The New American Etymological Reader. By Epes Sargent and Amasa May. Philadelphia: E. H. Butler & Co.

In this book the attempt is made to associate the study of etymology with exercises in reading. The Etymological Introduction gives a very succinct account of derivatives, roots, suffixes, prefixes, etc. Then follow the reading lessons, at the end of each of which are given what are called select etymologies, which give the derivation, composition and meaning of the most important words of the lesson. Towards the end of the volume are given "Artificial Sentences for Etymological Practice," and an index of the words whose etymologies have been given in the book.

Since the Reader forms the principal text-book in teaching the use and spelling of words, it stands to reason that etymology can be taught successfully and with the least loss of time only in connection with reading. Etymology is of value solely as an adjunct to reading; and it can be fitly and effectually taught only in connection with the reading lesson. The Etymological Reader is therefore a step in the right direction, and one which should be introduced into every school having classes of the first grade. Teachers who are seeking for the best means of teaching word-analysis, can do no better than to examine and consult the Reader under notice.

The Scholar's Companion. By Rufus W. Bailey. Philadelphia: E. H. Butler & Co.

The great value of this book will be seen from a short abstract of its principal contents. The work is divided into three parts. Part First embraces a large selection of cognate and equivocal words; the former including, first, words which are pronounced exactly alike but spelled differently, arranged according to the sound of the principal vowels, and, secondly, words of similar pronunciation; the latter (equivocal words) including words whose different significations have either no connection with each other, or none which can be easily traced: *e. g.*, *address*, as verb, signifies to accost, but as noun signifies deportment, dexterity, direction of a letter, a speech. Among the cognate words is included a list of dissyllables spelled alike, but differing in accent: *e. g.*, *impress*, signifying, when the accent is on the first syllable, mark, stamp; but when the accent is on the second syllable, signifying to print. Part Second treats of the composition and derivation of words. Part Third embraces the study of synonyms.

Mitchell's New Outline Maps, with Keys. Philadelphia: E. H. Butler & Co.

We are in receipt of the small and large series of these excellent and well-known outline maps. For cheapness, beauty and accuracy of construction and coloring, and security of mounting, no better series of maps has come under our observation. The maps are constructed by A. von Steinwehr. The same author has prepared a key to accompany the maps.

THE AMERICAN CHILD'S PICTORIAL HISTORY OF THE UNITED STATES. A PICTORIAL HISTORY OF THE UNITED STATES. By S. G. Goodrich. Philadelphia: E. H. Butler & Co.

The "American Child's Pictorial History" is the last work of the author of "Peter Parley's Tales," and was prepared by him to serve as an introduction to the "Pictorial History." The latter work has been before the public so long that any criticisms on our part would be superfluous. The new edition, dated 1873, brings the history down to 1866.

A PICTORIAL HISTORY OF THE WORLD, ANCIENT AND MODERN, FOR THE USE OF SCHOOLS. By Samuel G. Goodrich. Philadelphia: E. H. Butler & Co.

The design of this work is to furnish a clear outline of Universal History, suited to common schools. The importance of Universal History as a part of general information, and its adaptability as an introduction to the study of the History of the United States, make it very desirable that some book, like the one under notice, be in the hands of the scholar, if not as a text book, at least as a library book.

THE LIBERAL EDUCATION OF WOMEN; THE DEMAND AND THE METHOD; CURRENT THOUGHTS IN AMERICA AND ENGLAND. Edited by James Orton, A. M., Professor in Vassar College. New York and Chicago: A. S. Barnes & Co.

"This volume is a reprint of certain representative articles which have lately appeared in America and England, touching the liberal or collegiate education of women. Its object is to bring together some leading thoughts upon the method of meeting this demand of the age." This extract from the "introductory" explains the object and scope of the volume. From the large mass of material—which alone is a proof that the subject of female education has become a recognized question of the day—the editor has made such an impartial selection that every phase and side of the subject is fairly brought before the reader. This book is one of the most noteworthy contributions to the cause of general education, we have lately met with. Paper, typography and binding are an honor to the publishers.

LATIN PRONUNCIATION. By Walter Blair, A. M. New York and Chicago: A. S. Barnes & Co.

This book is an inquiry into the proper sounds of the Latin language, and was originally prepared by appointment of the Educational Association of the State of Virginia. The conclusion arrived at by the author is, that what is known as the Continental pronunciation is the correct pronunciation. So, at least, we infer from the tabular statement of the sounds of the Latin language on pages 127 to 129, where the letters have the sounds usually given to them by the German and French linguists.

SCRIBNER'S MONTHLY.

In the July number is given the first installment of the long-promised "The Great South." The article is well written, and illustrated with good judgment by Edward King, and describes a trip from Kansas as far as Northern Texas. "Low Life in Berlin," another illustrated article, will be read with interest by all who delight to ramble through the manifold phases of low life peculiar to great centers of population. "The Liberty of Protestantism," by an Orthodox Minister, is written in a very sensible way, and very different from what is usually expected from Orthodoxy. "The Religious Sentiments of Abraham Lincoln," disproves two of the most outrageous allegations made in Lamon and Herndon's "Life of Lincoln," viz: that Lincoln was born out of wedlock, and that he died a hypocritical infidel. "Recollections of a Restored Lunatic," gives Dr. Newell's account of his sojourn as a patient in one of

the New York Lunatic Asylums. A few sensible remarks concerning juvenile literature are found in "Children's Magazines." Three additional chapters of Arthur Bonnicastle" are given. The tales and poems are very good. The "Topics of the Time," the "Old Cabinet," and "Culture and Progress," are as full and varied as usual.

LITTELL'S LIVING AGE.

The number of *Littell's Living Age* for the week ending July 5th, begins a new volume, and is a good one with which to begin a subscription. It has the following valuable articles: Darwin on Expression, from the *Quarterly Review;* Amateur Theology (Arnold's Literature and Dogma), *Blackwood's Magazine;* Prussian Ecclesiastical Laws, *Saturday Review*; an instalment of "The Two Brothers," a tale by the distinguished French authors, MM. Erckmann-Chatrian; and of "The Presecotts of Pamphillon," by the author of the charming story "Dorothy Fox;" with poetry, etc.

Among the chief articles of the two preceding weekly numbers are, Central Asia; Louis Napoleon Painted by a Cotemporary; The Sons of Ham; The State of English Painting; The West Coast of Africa; Extravagance: The Dutch Colonial System; an instalment of "Innocent," by Mrs. Oliphant, etc. etc. The subscription price of this sixty-four page weekly magazine is $8 a year; or for $10 any one of the American $4 magazines is sent with the *Living Age* for a year. Littell & Gay, Boston, publishers.

OVERLAND MONTHLY.

The July number of this Monthly is devoted largely to questions of the day. "Scraps of Modoc History" occupies itself principally with the Ben Wright's massacre, and the events immediately preceding and following it. "Our Relations with Mexico," treats of the high-handed outrages which Americans have and are constantly suffering, and which makes, in the words of the author, the "policy of the United States, considered as the attitude of a great and prosperous nation to a weak and bankrupt one, magnanimous in the extreme; but considering the interests of American citizens in Mexico, of American commerce, and of residents of the United States near the border, it renders more than justice to Mexico, and less than justice to ourselves." "Borax Deposits on the Pacific Coast" describes one of the mineral resources of California, lately largely developed. "The Lepers of Molokai" describes the village to which the Hawaiians banish their lepers. The writer stoutly insists upon the contagiousness of leprosy; and his facts and arguments carry conviction with them. All who have visited the islands, and have had opportunity of observing the domestic life of the natives, will agree "that the unbridled licentiousness of the people has begotten the seed of the plague that is scattered broadcast over the land, and through promiscuous intercourse it is nourished and increased." "Hetch-Hetchy Valley" is a description of the Lower Tuolumne Yosemite, eighteen or twenty miles north-west from Yosemite.

Among the stories, the most noticeable are, "Ultrawa," No. 9; "An Old Fool," conclusion; and "My grandmother's Legacy." "The Mountain Posy" must be already known to many readers: it was first published by the same writer, though in a less elaborate form, some years ago. Joaquin Miller contributes "By the Northland Lake." Etc. contain "The gain of a Man," which speaks a good and encouraging word for the President of the University, whose whole-souled labors are bearing such abundant fruit; "Our Female Graduates," which impresses upon the female graduates of the University the duties which education imposes upon them; and

"Fashion," which utters a little much-needed counsel upon this old but ever new subject. The Book Notices are unusually full and good.

THE SANITARIAN. A Monthly Journal. New York: A. S. Barnes & Co.

The July number of this Monthly presents a variety of topics of popular interest. The opening article treats of "Bread: Tests and Adulterations." The second article tells us "How to Cure a Cold." Our readers may imagine the treatment suggested, if they bear in mind that the editor of the *Danbury News* is the prescriber. The article next in importance to the first article is "Wet-nursing and Artificial Feeding." The article is the third of a series entitled "Practical Points in the Medical Care and Nursing of Children;" and commends itself for its perspicuity to the attention of all intelligent readers, especially to mothers and nurses. "Public Hygiene" and "Public Health" occupy prominent places. A variety of other articles make *The Sanitarian* well worth its subscription, $3 00 a year.

THE VALLEY WORLD.

This is a new Weekly, which made its first appearance several weeks ago. It is a quarto, filled with interesting and spicy articles about the topics of the times. The typography and presswork is of that artistic excellence by which the publishers have attained that enviable distinction of doing the best book and job work in Sacramento. Published by H. A. Weaver & Co., successors to E. G. Jefferis & Co.

BOOKS RECEIVED TOO LATE FOR NOTICE THIS MONTH.

A Complete Latin Grammar for Class Use in Schools and Colleges. By C. K. Bartholomew, M. A. Cincinnati: Wilson, Hinkle & Co.

Mind and Matter: or Psychological Inquiries. New York: William Wood & Co. San Francisco: A. L. Bancroft & Co.

Miss Beecher's Housekeeper and Healthkeeper. New York: Harper & Brothers. San Francisco: A. L. Bancroft & Co.

Ahn's Series of German Readers. New York: E. Steiger.

American Text Books of Art Education. By Prof. Walter Smith. Boston: James R. Osgood & Co.

Coe's Drawing Cards. New York: John Wiley & Son. San Francisco: A. Roman & Co.

Bartholomew's Primary School Drawing Cards, Nos. 1, 2 and 3. New York and Chicago: Woolworth, Ainsworth & Co.

The Mouth of Gold. By Edwin Johnson. New York: A. S. Barnes & Co.

TO TEACHERS AND SCHOOL OFFICERS.—We have for sale at this office a few copies of the Educational Year Book, for 1873, published by Wm. Wood & Co., of New York. It is printed on heavy, tinted paper, in clear type, and substantially and tastefully bound. It is a handbook of reference, comprising a digest of American public school laws, systems of instruction, and interesting matters pertaining to schools and colleges, ranging from professional anecdotes to educational statistics. The work has been commended by the most prominent educators throughout the country. Price, $1 25; sent, post paid, on receipt of price. Address,

THE CALIFORNIA TEACHER, Sacramento.

THE

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SEPTEMBER, 1873.

VOL. XI. SACRAMENTO. No. 3.

THE CIRCULATION OF THE WATERS ON THE SURFACE OF THE EARTH.

I.

We live on the boundaries between two oceans; above the liquid expanse of the watery main, and at the bottom of the blue deeps of air. It is impossible for us to reach the surface of the latter, for our highest mountains pierce but its shallows, the azure waves rolling far above their summits. Of the former, only the surface is known to us; the secrets of its depths are hidden from our ken. Thus the greatest part of the firm crust of the earth is withdrawn from our investigation. Mighty masses of earth, it is true, rise up out of the ocean, making the proportion of the firm bottom of the sea of air to the liquid one, as 51 to 146. But the idea that, could we succeed in draining the ocean dry, those masses that tower over the level of the ocean would serve to fill up the gaps, is long ago renounced as being incorrect. Humboldt fixed the mean height of the continents at about a thousand feet above the level of the ocean, while Bache calculated the mean depth of the Pacific at 14,190 feet, from the time needed by the wave of the earthquake (December 23d, 1859, when the Russian frigate Diana was lost), which rose thirty feet above the usual level, in the harbor of Simoda in Japan, to cross the Pacific to San Francisco and San Diego in California — rate = .6 league per minute, by 217 miles

breadth of wave. Still, this ratio is greatly exceeded in the deepest places; for Ross, at a southern latitude of 15° 3′ and a western longitude of 23° 14′, found no bottom at a depth of 27,600 feet. Denham, in the Herald, found soundings in the South Atlantic Ocean, but at 46,000 feet; while Parker, in the Congress, and much about the same spot, failed to find bottom at 50,000. Brooke let down a plumb line measuring 42,240 feet in the Indian Ocean, a sea in which the ancient merchants used to point out a spot at the mouth of the Hoogly, in the Bay of Bengal, which they believed to be unfathomable, and therefore called "the bottomless pit." Let us, however, imagine our supposition carried into effect, viz: all the seas drained, all the rivers run dry; we should be very much at fault, were we to imagine we had now arrived at the region of rigidity, of freezing. For the heat which increases rapidly inwards, aids us in coming to the conclusion that, at a comparatively inconsiderable depth, that which on the surface is firm will liquefy in the heat of the central fire; that the hard crust which surrounds this liquid heat does not bear the same proportion to it as the egg-shell does to the contents of the egg; nay, is so fragile, that recently the opinion was expressed, that this shell of earth is incapable of supporting such a weighty load as the Himalayas, and that this mountain range floats in the central liquid ocean like an iceberg in the waters. And no contemptible one, methinks, for this range towers five miles above the level of the external ocean. Judging by this, it is not hard to suppose that since even now the liquid so far exceeds the solid, the difference at an early period has been very much greater; perhaps, indeed, that the whole earth was once liquid.

The fundamental character of a fluid is the extreme mobility of its parts, which yield to every force that sets it in motion. If no external power, but their mutual attraction, operates on the fluid, the separate parts have nothing left to hold them together. They naturally assume the form of a globule, for the spheroid is that form which admits of the closest approach of all the several parts. If water falls, gravity can exercise no fashioning influence on it, as all the parts of a falling body move with equal rapidity; we here, then, perceive the spherical form at once assuming the figure of a drop. This may be demon-

strated in a still more striking manner by pouring oil, which swims on the surface in water, but sinks in spirits of wine, first into alcohol, and then adding so much water till this mixture, of heavier water and lighter alcohol, attains the exact density of the oil. The oil then rolls itself into the form of a perfect ball or globe, which floats about in the transparent mixture, as does our earth in space. Now if a piece of wire, furnished at the lower end with a vertical metal plate, is thrust through the cork of the square glass vessel containing the mixture, it is easy to attract the globe of oil to this circular disk in such a manner as to cause it to completely encompass it. This done, turn the wire slowly round; the revolving of the inner plate sets the oil in motion, which gradually assumes the spheroidal form; that is, it becomes flattened at the poles. Increase the rapidity of the motion, and the oil will detach itself, and turn like a ring around its rotatory axis. As in the second experiment we behold, as it were, Saturn's rings forming under our eyes, so the first offers us the key to the riddle how the earth first assumed its spheroidal form, and how the ocean exhibits this form best, the irregularities of the land preventing its being so distinctly visible. Calculating our motions in reference to the center of the earth, the nearer then we approach the equator, the farther we go from that center; and indeed the mouth of the Mississippi is farther removed from the center of the earth than its source. Those who delight in quaint expressions can therefore say, if it so please them, that this mighty stream flows up hill. But in order to judge of the fall of a river, its superficies must be fixed at every point of its geographical latitude according to its distance from the level of the ocean; that is, according to the position which its waters, along with those at its mouth, would take in a state of repose.

We have compared the earth to a falling drop. It is, however, less a comparison than the real fact, only in this case it is a drop falling towards the sun. I here employ the word "fall" in the same sense as Newton, viz: that gravity has the same effect on the moving body as on the stationary. If, standing on a frozen lake, I fire a ball from a gun held scrupulously horizontal, and the same second drop another out of my hand, they will both touch the surface of the ice at one and the same

instant. Rapidly, then, as the powder propels the ball, it still cannot escape the law of gravity; it falls exactly as the ball not acted on by the powder. The earth is such a ball, hurled into space; and once set in motion it would, but for the sun, fly straight on, only the sun will not suffer that. He compels the earth to deviate from her straight course, and to fall towards him; thus instead of a rectilinear path, she strikes into the circular one. All the effects of the forces, however, diminish with increased distance. That spot of the still liquid earth which is turned to the sun, falls farthest from the rectilinear point of contact, the centre less, and the side altogether averted least of all. Thus both poles, diverging from the centre, impart to the liquid earth an elongated spheroidal form, its longer axis turned towards the sun. Such a change of form can naturally not take place in solid earth, as the closer adhesion of the parts necessarily prevents any displacement. All its parts therefore move in like manner as the center point, namely all those *before* this same center point hurrying it on in the same degree as those behind drag it back. Now our earth being neither all solid nor all liquid, the liquid water will form its spheroid on the unvarying solid globe, that is, it will accumulate at the two ends turned to and from the sun, and flow off from the sides to both places. If the earth did not revolve on her axis, then the ocean would once for all be deeper at the two former points, at the latter, shallower. But the earth revolving, the heavenly body which influences the flood changes its position, before the spheroid he has been trying to form in the liquid covering of the earth has been completed. In this manner a wave is produced, which follows the heavenly body in its apparent course round the earth. The liquid spheroid then hangs over the solid globe which revolves under it; each place in this way coming twice during the day, at noon and at midnight, to the spot of the deepening ocean, and twice, at six o'clock in the morning and in the evening, to the shallow spots. This phenomenon is known as the ebb and flood.

Hitherto we have only taken the sun into consideration, and not mentioned that mute companion of our earth, the moon, to whom the earth takes the same place as the sun to us. The

attraction, however, is mutual, the moon not only inclining to the earth, but likewise the earth to the moon, *i. e.*, the former moves more rapidly when the latter stands on her path before her, more slowly when behind her; and she inclines sideways out of her path when the moon does the same. The same reasons which are at work to cause the sun to produce a flood, operate likewise on the moon, and with a similar effect. When all three bodies are standing in a straight line, as at full moon and new moon, the solar flood falls to the same spot as the flood caused by the moon; therefore the water rises here, for two reasons, higher than usual. When the three bodies form a right angle, which happens in the first and third quarter, at the same spot where the moon raises the tide, the sun causes an ebb, and we have therefore the difference of two effects. The former floods, known as the Spring tides, are considerably higher than the latter, to which we give the name of the neap tides. But as the moon rises each day well nigh an hour later than the preceding (exact time fifty minutes), so if both tides meet to day at noon, the lunar tide will set in to morrow at one o'clock, while the solar tide, unchanged, will make at noon; the following day the former will take place at two o'clock, and so on. Thus in a week the lunar flood and solar ebb will happen together, while in a fortnight the flood will again set in as at the beginning of this term.

Now we might believe that as the small, near moon, in the place where it hangs in the heavens, has, by a hundred and sixty times, a weaker power than the big, far off sun, the lunar tide would be comparatively less. And so it should, if the whole powers of attraction of the heavenly bodies were spent in the producing of the tides. But we have seen their power of producing tides is only the difference of their effects on the surface and on the centre of the earth. The half of the earth's diameter nearer or more removed, is a much more considerable matter than with the sun; for the latter is distant from us twelve thousand times the length of the earth's diameter, the former only thirty times. Hence a thirtieth of the lunar power is to the twelve-thousandth part of the solar power, as 5 to 2 (more exact, as 50 to 18). Wherefore the sea rises two feet under the influence of the sun, but five under that of the moon,

for the difference between two small numbers can be much greater than that between two large ones. At the spring tides the water rises 5 *plus* 2, therefore seven feet; and at the neap tides 5 *minus* 2, that is, it rises three feet.

[*For the California Teacher.*]

PROGRAMME FOR TEACHING THE COURSE OF STUDIES.

Every teacher should have posted up in the school room, an established order of exercises for each day in the week, assigning a definite time for the beginning and ending of every exercise, and of every interval between the exercises; and this order should assign definitely, also, the times for study and topics of study, as well as of recitation.

It is impracticable to establish a uniform rule respecting the frequency and length of recitations; this will depend altogether upon the number of divisions a teacher has to teach. In deciding what proportion shall be given to the different studies, or their branches, the general rule should be, that whatever branch a division is less advanced in, let that particular branch receive special attention till it is as familiar as the other branches. It is very common to find a class more advanced in reading than in numbers, and still devoting less attention to arithmetic than to reading. The observance of the above rule will correct all such errors.

Many teachers seem to think that every branch prescribed by the course of studies must be made a *daily* study. This may be practicable in schools maintaining more than one department, or in which every division of the course is not represented; but in a majority of our country schools this will be impracticable, and in such cases it will be necessary to pursue a great many studies on alternate days. The only exception will be in favor of the third and fourth divisions of the third grade, whose different studies must be *daily*.

But even with alternate recitations it will sometimes be difficult to find time for all the exercises required by the course of studies. The following suggestions may therefore be of service

to teachers in making out their daily programme. It must be premised that the following programme is made for a school in which every division of the course is represented; in other words, for a school in which the teacher has to teach at least eight classes. If the teacher has fewer classes, some of the recitations may be lengthened, or be given more frequently. Teachers must bear in mind that for the primary classes, say the third and fourth divisions of the third grade, the recitations must be short and frequent; and even the time set apart for the pupils to study their lessons, or to do slate or blackboard work, must be short. Short and frequent recitations, short and frequently changed exercises on slate and blackboard, must be the rule; pupils must never be tired or wearied by a recitation or an exercise. But as pupils are older and more advanced, the recitation must in proportion be longer and less frequent; pupils must be more and more independent of the promptings, care and supervision of the teacher.

To prepare a programme according to which the course of studies may be fully carried out in a school taught by one teacher, and maintained only five months—the minimum length of school terms assumed in preparing the course of studies—we must,

I. Divide the day into periods, during each of which instruction is given and recitations are heard in some one study.

II. Whenever possible, the whole school, or as many divisions as possible, are formed into one class. In music, calisthenics, morals and manners, this will be the only practicable way of giving instruction. To illustrate:

Let every day one hour be devoted to teaching arithmetic. During this hour the *whole school* is to be instructed, is to recite and work, on slate and blackboard, in arithmetic. Let, for instance, this hour be from 9 to 10 A. M. At 9 A. M., after the usual opening exercises, every class in the school takes up its arithmetic lesson, and goes to work. The third and fourth divisions of the third grade should receive instruction and recite every day. The best time for this will be found to be immediately after the opening exercises. After reciting, these grades are set to work, either on the slate or blackboard. After the lowest two divisions have recited, the class which is most in need of instruction is next called forward and taught. In this manner,

every day, besides the lowest two divisions, one or two of the higher divisions receive instruction, and in the course of a week every class in the school has received instruction. This instruction should be thorough enough to enable the class to advance a step each time, and to be fitted to profitably employ the rest of the week in grounding the instruction received, by working out the examples given in the arithmetic or furnished by the teacher by means of the arithmetical frame or the blackboard. It will be found that it is more profitable to leave a class to itself for several days, or even a week, in order that by self efforts it may perfect itself in applying the principles and rules just learned, than to let it recite every day. If, for instance, a class has just learned short multiplication or division, and seemingly every one in the class understands the work, it is yet of the utmost importance, if for no other purpose than to ensure rapidity and quickness of work, that the class be thoroughly drilled; and most teachers will find that a single week will seldom be sufficient to do this. A single recitation may therefore only be needed to enable a class to be profitably employed for several days, or weeks even; and the teacher, by assigning a part or the whole of the class to the blackboard once or twice a week, and by looking over their slates, can easily watch the progress of the class, and discover when it needs some additional instruction or help from him.

Instead of having a daily recitation from every class in the school, which would consume at the very least two hours, and yet not give sufficient time to each recitation to allow of thorough instruction, by the above plan at least one hour a day is saved for other work; and as sometimes as much as forty minutes may be devoted to a single class, the instruction will be all the more thorough.

At 10 A. M., all arithmetic work is finished for that day. The next forty minutes, till recess, 10:40 A. M., are best spent in instructing the whole school in penmanship or drawing. For three days a week, penmanship should be taught during this time; for two days, drawing. At 10 A. M., the copy books, or drawing books, and slates are taken up, and each division set to work. The third and fourth divisions of the third grade should receive daily instruction. The only instruction in penmanship

these two divisions receive is given while they are taught to print or write the words or paragraphs of their reading lessons; and so, while these divisions are instructed in writing they are also instructed in spelling; and thus, for each of these divisions, two recitations are disposed of at one and the same time. In fact, for the third division, three recitations are disposed of; for composition, which for this division consists principally in copying words and sentences printed or written on the blackboard by the teacher, can be taught in connection with writing.

After these two divisions of the third grade have recited and been set to work — which is done usually inside of twenty minutes — one or two of the other divisions can be instructed during the remaining time, and advanced sufficiently to need no recitation for several days. In other words, the same plan which has been suggested for teaching arithmetic will be perhaps the only practicable one for teaching penmanship and drawing.

From 10 to 10:40 A. M., the third and fourth divisions of the third grade have been instructed in spelling; the third division of the third grade in composition, and the whole school in penmanship or drawing.

From 11 to 12, first, object lessons for the lowest two divisions of the third grade, which, after recitation, are dismissed; then on Monday and Wednesday, geography for the four divisions of the first and second grades; on Tuesday and Thursday, history for the two divisions of the first grade, and geography for the first division of the third grade and second division of the second grade.

1 to 2:40 P. M., reading and spelling for the whole school. At 2:40, the third and fourth divisions of the third grade (which are presumed to comprise a majority of pupils under eight years of age) are dismissed.

From 3 to 4, on Monday and Wednesday, composition and grammar for the first and second divisions of the third grade, and the four divisions of the second and third grades; on Tuesday and Thursday, object lessons, natural philosophy, and physiology, for the same divisions. Studies and instruction for which no provision is made in the above—such as music, morals and manners, calisthenics, etc.—must be taught on Friday. This day should be used also for such general exercises as declamations, reviews, etc.

(To be Continued.)

[*For the California Teacher.*]

TEACHING READING.

In order to teach reading successfully, we must always remember that the first aim of a reader is to comprehend the thoughts of the author he reads. The second aim may be to convey to others an intelligible idea of the author's meaning. In reading, we must, therefore, observe two distinct elements: the *logical*, or the contents, subject matter; and the *phonetic*, or the form, words, in which the contents are expressed. The first object is, therefore, to lead the pupils to an understanding of the subject-matter; and the second, to call attention to a conscious delivery. The first is an exercise of the mind and judgment; the second also, but more a matter of observation and imitation. Let it be borne in mind, that pupils will read well only what they understand well; therefore no attempt should be made to read a lesson before every thought or idea expressed therein has been carefully analyzed and criticised.

In accordance with the principles laid down, reading lessons should be treated as follows:

First. Allow pupils to study the lesson.

Second. When the class is called forward for recitation, ascertain most carefully if every word of the lesson is understood, and if pupils are capable of defining the more difficult ones, or of substituting some other word for any given word. Explain and exemplify difficult and figurative expressions, metaphors, etc. The following more definite instructions, taken from the *Chicago Revised Course of Instruction*, 1872, may be of service:

"To test the accuracy of the child's knowledge of what he reads, he should be encouraged to alter sentences, substituting for some selected words, words of his own choosing, that shall change the form but not the meaning of the passage. This exercise may embrace at first but a single word in each sentence, and then may be extended as the capacity of the pupil may seem to warrant, until nearly or quite all the words are changed. In the more advanced classes, poetical selections may be changed into prose. While the definitions given by the author should not be neglected, the child should be encouraged, so far as possible, to give definitions of his own; and should be permitted, as

indicated above, to put his definition into the place of the words defined, and then to read the sentence he has changed. This test may be still further extended by requiring the pupil to embody the selected words in sentences of his own construction. If the teacher finds difficulty in securing proper expression in any particular way, the remedy may be found in asking a question, the proper answer to which would be the difficult passage, and in requiring the pupil to give the passage as an answer to the question asked."

Third. Proceed now to read the lesson in a loud and clear voice, giving every sound a distinct utterance; in short, read it to your class in the most suitable and becoming style.

Fourth. Request the pupils to read; examine and drill them until a high degree of perfection is attained.

Fifth. Request the pupils to give a verbal account of the subject-matter of the lesson.

We subjoin some further suggestions from the above quoted course of instruction:

"The advantages of concert-reading will not pay for a single bad habit formed by its careless use. The attention of the class may be kept by other methods, one of which is of importance in the recitations as well — that is, calling your scholars out of their regular order of standing or sitting; and, if need be, calling upon the same person two or three times, until the impression that he will be called on but once is entirely dissipated. Answers to general questions connected with reading lessons may be given in concert. The enunciation of elemental sounds may also be given in concert. Poetical selections which are already measured, may also be given in concert, with less difficulty and with less danger than prose.

"While a class is engaged in reading, the undivided attention of the teacher should be given to it. If the attention of the teacher be called away necessarily, the exercise should be suspended.

"Children should be encouraged to criticise each other fairly and justly. Raising the hand during the progress of the reading should not be allowed; but, at its close, those who have noticed errors should have an opportunity of correcting them, provided always that the critic can illustrate his own criticism. This should be occasionally tested.

"An excellent teacher gives as the result of her experience, this important caution: 'Children must be taught to open their mouths before they can become good readers.' The importance and value of this suggestion are fully confirmed by the experience of all good teachers.

"Frequent exercises, varied according to the advancement of pupils, in the utterance of elementary sounds, single and combined, should be most faithfully attended to before each exercise in reading. * * * While good articulation is not the *end* of reading, it is an essential *means*, and one without which the true end — expression of thought — can never be attained.

"There is no fault more common in reading than that of stumbling, hesitating, catching and repeating. It is but one fault, and teachers should use every effort to break it up. The moment the child shows the first symptom, his case should be carefully but immediately considered, and strict attention at once given to its cure. It sometimes arises from the child's vocal organs getting the start of his thoughts, and should be cured by a little hard study, until the pupil becomes familiar enough with the thought to have his mind keep ahead of his voice. It sometimes arises from pure carelessness, and its cure needs no mention. It often arises from the use of books in advance of the child's capacity, so that reading becomes mere utterance, without so much as a thought creeping in even behind a word uttered. The case suggests its own remedy. It sometimes arises from indulgence in a similar habit in all other recitations. Whatever its cause, its cure must be certain, or no progress is made, but on the other hand constant retrogression.

"Improper breathing has much to do with poor reading, and a variety of breathing exercises should be practised in connection with each lesson. Among those most beneficial may be mentioned: slow and silent inhalation and exhalation; quick inhalation and very slow and silent exhalation; quick inhalation and explosive exhalation; slow and silent inhalation and explosive exhalation; quick inhalation and slow exhalation, with the utterance of some simple vowel sound; slow inhalation and explosive exhalation, with the utterance of some simple vowel sound, etc. All these exercises should be practised by the class, standing squarely and fairly upon their feet, with shoulders thrown back and head in its natural position."

The several readers give abundant phonic and elocutionary rules and exercises. If time permits, the exercises given in Murdock and Russell's *Vocal Culture* may be taken up. The book should be in every school library.

Special attention should be paid to the reading of poetry. It is just as easy to train children from the very commencement to read poetry according to the rhythm, poetical pauses, etc., as to permit them to acquire the so common sing-song style of reading poetry. In the Fourth Reader all needed instructions are given. Of course, in the divisions of the third grade, the pupils are not to scan the poetry before reading it. The teacher simply insists that the pupils read as he reads—emphasizing syllables, making pauses, etc., as they hear the teacher do.

No special instructions are necessary besides those given in the Course of Studies and in the several Readers, except in regard to the fourth division of the third grade. In teaching this division, the word-method is to be used exclusively according to the instructions given in Calkins' *Object Lessons*, page 288, *et seq.* But as the pupil is not called "upon to learn only words that are quite or entirely dissimilar to each other, but as to every word he learns to-day he will find ere long some other word quite similar in form, he should be taught the separate features of each word, that when he finds one generally similar, he may be able to fasten upon some point of difference that may serve as his guide in naming his acquaintance. Hence words should not be considered as learned until the pupil is able to pronounce them correctly at sight, and to give a complete analysis of the words, both by sounds and letters. The word method must therefore be followed or accompanied by the analytic and synthetic, or spelling-method. In using the charts, a large number of exercises may be introduced besides those found thereon. The words may be combined into an almost infinite variety of sentences. The teacher may give short and simple sentences, containing words found upon the charts, and require the pupils in turn to find the words upon the charts; or he may require some one pupil to point out the words while the class reads the sentence after his pointing. Sentences may be printed upon the board, and the pupils be required to find the words upon the cards. The practice of framing words into sentences is of great

importance, so that the child may attach some ideas to words read, and thus avoid tones so common to those who repeat mere words without ideas. It is well to keep a list of words printed upon the board, to which may be added some new word each day.

"The oral exercises may be made subservient to this reading exercise. The child should be taught the names of objects about which he is learning, unless they be too difficult, so that he may recognize the word-picture of the object, as he recognizes any other picture. Nearly all names of common objects he may learn in connection with his object lessons, without much extra effort on the part of the teacher. Indeed, each reading lesson should be made, in part at least, an object lesson."

From the Popular Science Monthly.

GEOGRAPHY IN SCHOOLS.

While there is great ado about methods in treating this subject, and the "battle of the geographies" waxes fierce before the school boards, but few stop to inquire into the real claims of the study, and he who should venture to say that it has no business in schools at all, that it usurps time which had better be given to other things, and is of very low value as a means of mental cultivation, would be regarded as absurd. Yet such an idea is entertained by many thoughtful persons, and it increases in force as our educational system is more closely scrutinized.

In his celebrated inaugural address, at the University of St. Andrews, Mr. J. S. Mill remarked: "It has always seemed to me a great absurdity that history and geography should be taught in schools; except in elementary schools for children of the laboring classes, whose subsequent access to books is limited. Who ever really learned history and geography except by private reading? and what an utter failure a system of education must be, if it has not given the pupil a sufficient taste for reading, to seek for himself those most attractive and easily intelligible of all kinds of knowledge! Besides, such history and geography as can be taught in schools, exercise none of the faculties of intelligence, except memory."

If this very decisive verdict be thought merely the opinion of a theorist, it is easy to reinforce it by the judgment of practical men who speak from experience in the management of schools. A committee on "Text books, and a Graded Course of Instruction," of public schools of Milwaukee, in their report to the Board of School Commissioners on the study of geography, say: "The committee have given the subject full and careful consideration, and have come to the conclusion that the study of geography, as now pursued in our schools, should be radically changed. Considering the time devoted to it, and the application required, we are of the opinion that no study is productive of results so meagre and unsatisfactory. It will not be contended that much is to be gained in the way of mental discipline from geography as taught in this city, and we might as well say generally throughout this country. The same amount of time and labor bestowed upon many other branches of knowledge, would do a great deal more for development of the faculties of the mind. About the only positive result obtained is, storing the memory with an array of disconnected facts, which may indeed be made available in astonishing visitors at examinations, but are utterly useless as a means of unfolding the thinking powers. Nay more, the very object of the study is defeated by the methods of instruction commonly in use. It is possible to find whole classes of pupils who have spent several years in 'learning geography,' and who can answer endless columns of questions in locating places, but who can in no sense be said to have acquired the knowledge which geography—rightly understood—is intended to impart."

They remark further: "The committee are of opinion that altogether *too much time* is devoted to geography in our schools. It seems to us that a sufficient knowledge of the subject might be acquired by considerably abridging the number of lessons, and giving the time to studies of at least equal importance, which are now sacrificed to make room for the geography recitations. A competent knowledge of our own language is surely one of the leading objects of the most common education. We are of opinion that our course of instruction in the English language is altogether too limited in its scope and imperfect in its methods. This should include something more than reading,

spelling, grammar, and an occasional composition. The language, in its elements and structure, should be taught on scientific principles, so far as they have been ascertained, and the power to use it in speaking and writing, not only correctly but elegantly, systematically *developed* from the lowest to the highest grade. Then, again, no course of instruction — however elementary — can in our day be said to be complete, which does not aim to cultivate some acquaintance with the leading outlines of natural science; and we are persuaded that, in the more advanced grades at least, a portion of the time at present given to geography might be advantageously devoted to giving instruction in botany, zoology, physics, and astronomy, by oral lessons of a simple and elementary nature."

Mr. Mill says that geography exercises none of the powers of intelligence except the memory, and the committee declare that it does this badly; and both, we think, are right. Loading the memory with an array of arbitrary and disconnected facts is not the proper method of cultivating it. The true office of this faculty is, to be the servant of the other faculties. It is the power which recovers for present use the mind's past acquisitions. But the power of recalling past impressions rests upon the law of association, and rational memory depends upon the relations subsisting among the mental impressions. If knowledge has been digested, and the relations among its objects seen, their recovery in thought is easy and natural; but where the other faculties are neglected, the memory is merely burdened with arbitrary statements, and only those things are remembered that are burnt into it by interminable repetition. Dr. Arnold reprobates the ordinary school-method of treating geography, and commends the point of view here indicated. He says: "And this deeper knowledge becomes far easier to remember. For my own part, I find it extremely difficult to remember the positions of towns, when I have no other association with them than their situations relatively to each other. But let me once understand the real geography of a country — its organic structure, if I may so call it; the outline of its skeleton, that is, of its hills; the magnitude and course of its veins and arteries, that is, of its streams and rivers; let me conceive of it as a whole made up of connected parts; and then the posi-

tions of towns, viewed in reference to those parts, become at once easily remembered, and lively and intelligible besides."

The objection to teaching geography to the young is, that its entire subject matter is beyond the sphere of experience; it is, therefore, much less fit to be used as a means of cultivation than many other subjects. Geography deals with an order of ideas which it is extremely difficult for the adult mind to grasp in their true relations, and impossible for the minds of children. "Geography is a description of the earth," and, to begin with, the earth is "a vast globe or ball." Now, a child may have a correct conception of a ball, which it gets from experience, but no conception from experience which will help it to a true idea of what is meant by "25,000 miles in circumference." The notion is utterly beyond its grasp, and so far from KNOWING the fact, or forming any just mental view of it, it is merely cheated with words. And so it is with the attempt to conceive the extent and relations of the great continental and oceanic tracts of the globe, or of its minor subdivisions into zones and countries, or of its great mountain and river systems. Into all these phenomena there enters an element of vastness, a magnitude of relations, and a scale of diversities, which are little more to the childish mind than if they were described to it in a language not understood. Maps, of course, are helpful, but they are only symbols which the pupil is incompetent to translate into reality. It matters nothing that all the statements of geography may be true; they are true to the pupil only as verbal statements made on authority. All that it can do is to memorize words of description, which is the lowest and most worthless work of education. An English gentleman, who was once riding on horseback in the country, was accosted by a boy, who offered, for a penny, to tell him all the capitals of Europe. When he had done, the gentleman replied, "Here is your penny, and I will give you another if you will tell me whether they are animals or vegetables." "Animals," replied the boy, promptly. This is, no doubt, an extreme case; but it illustrates what is very generally true in the school study of geography—that the pupils have no adequate ideas of what the words mean.

The difficulty with geography is, that it does not rouse chil-

dren to think, and cannot furnish them with materials for the exercise of reason and judgment; because for this purpose, the things reasoned about require to be immediately accessible to thought. Without going so far as Mr. Mill, who declares geography in schools to be an absurdity, we are profoundly convinced that the current teaching of it to young pupils *is* absurd. It should be postponed to the later stages of study, when the mind has attained a considerable degree of maturity, and then, by means of globes, a general conception of the great features of the earth may be acquired. This will form a suitable preparation for that subsequent reading upon the subject which Mr. Mill suggests.—*The Popular Science Monthly.*

AGASSIZ ON PENIKESE ISLAND.

A few days ago, an educational institution unlike any other in the world was formally opened, and dedicated to its great purpose—that of the original study of nature; and the exercises of the occasion, lacking all the pomp and circumstance usual in such ceremonies, were in the highest degree picturesque and humane. The scene was a lonely island in the sea, in its seclusion not unlike that which Shakespeare created as the abode of Prospero; and for the lord of this island there was a greater master of nature than Prospero, but one who, like Prospero, "neglecting worldly ends,' was

> ——— "all dedicated
> To closeness, and the bettering of the mind
> With that which, by being so retired,
> O'er-prized all popular rate."

It was in the afternoon of the day which we have referred to that the greatest living *savant* of America stood in the midst of his island-kingdom, and of his loyal subjects and pupils, and then and there consecrated the whole territory to the high uses to which it is henceforth to be subservient. The building in which they had assembled was simply a rough, unfurnished barn, fitted only with tables and chairs, its great doors wide open, and the swallows flying in and out above their heads. With a manner the most unpretending, in the simplest language,

his face glowing with excitement, the learned man pronounced the address of dedication. It was evidently an unpremeditated utterance. It had no stately or impassioned oratorical periods. It was only the wise man conversing with his eager disciples upon topics connected with the circumstances which had brought them together there. As a piece of unassuming, sincere and thoughtful eloquence, it reminds one of the best talk of Socrates and of Plutarch's men. The speaking of this high-hearted speech inaugurated the Anderson School of Natural History; and in that speech there were two things which we cannot allow to pass without comment.

The first was this. After a few opening words, felicitously suited to put all their minds into fellowship, Agassiz said, tenderly and with touching frankness: "I think we have need of help. I do not feel that I can call on any one here to ask a blessing for us. I know I would not have anybody pray for us at this moment. I ask you for a moment to pray for yourselves." Upon this, the great scientist — in an age in which so many other great scientists have concluded that praying is quite an unscientific and very useless proceeding — bowed his head reverently; his pupils and friends did the same; and there, in the midst of a silence that was very solemn and very beautiful, each spirit was free to crave of the Great Spirit the blessing that was needed. For our own part, it seems to us that this scene of Agassiz and his pupils with heads bowed in silent prayer for the blessing of the God of Nature to be given to that school then opened for the study of Nature, is a spectacle for some great artist to spread out worthily upon canvas, and to be kept alive in the memories of mankind. What are coronations, royal pageants, the parade of armies, to a scene like this? It heralds the coming of the new heavens and the new earth — the golden age when Nature and Man shall be reconciled, and the conquests of truth shall supersede the conquests of brute force.

The other thing of which we must speak is the account which this marvelous teacher gave of the intended method of his teaching. "We don't begin our task by reading, by using any report of others concerning the subjects to which we will direct our attention. We are, I suppose, all intelligent enough to open

our eyes and look upon nature for ourselves, and we will try to make nature as it surrounds us, its own text book. Whenever we study books we are one remove away from the things that we would be better acquainted with. Instead of the things themselves, we appropriate the report of somebody concerning these things. You can hardly realize how strange a student feels who has a great deal of book knowledge, when he undertakes to study the things themselves. He feels as if it was an entirely new world, of which the best description ever given gave but a very faint and sometimes a very incorrect idea. It will tax your patience, and you will feel some discouragements, but you must overcome it. If you find what I place in your hand taxes your patience to the utmost, think that I did it purposely, and that you have to overcome the difficulty you may encounter in some way or other, and it will lead you in the right direction for observing for yourselves. That is the great thing to gain. What I want you to do is, to work yourselves. Don't read or ask questions. I shall not answer them, as you know you must understand things yourselves. It is a poor service to render to a pupil to give him a ready-made answer."—*The Christian Union.*

INTELLECTUAL CULTURE.

The consideration of the development and growth of the intellect furnishes the only true principles by which to regulate the culture of the intellect, and to arrange the order in which the different branches of knowledge should be studied.

The studies which should be first pursued are those which require and discipline the powers of observation and acquisition, and which involve imagination and memory, in contrast with those which demand severe efforts and trained habits of thought. Inasmuch, also, as material objects are apprehended and mastered in early life with far greater ease and success than the acts and states of the spirit, objective and material studies should have almost the exclusive precedence. The capacity of exact and discriminating perception, and of clear and retentive

memory, should be developed as largely as possible. The imagination, in all its forms, should be directed and elevated—we do not say stimulated, because, in the case of most children, its activity is never tiring, whether they be at study, work or play.

We do not say, cultivate perception, memory, and fancy, to the exclusion or repression of thought, for this is impossible. These powers, if exercised by human beings, must be interpenetrated by thought. If wisely cultivated by studies properly arranged, they will necessarily involve discrimination, comparison and explanation. To teach pure observation, or the mastery of objects or words, without classification and interpretation, is to be ignorant even to simple stupidity. But, on the other hand, to stimulate the thought-processes to unnatural and painful efforts, is to do violence to the laws which nature has written in the constitution of the intellect. Even thought and reflection teach us that, before the processes of thought can be applied, materials must be gathered in large abundance; and to provide for these, nature has made acquisition and memory easy and spontaneous for childhood, and reasoning and science difficult and unnatural.

The study of language should be prosecuted in childhood, as it is, in fact, in the study of the mother tongue. In the acquisition of other languages the methods by which the vernacular is learned should be followed as far as possible. Grammar, so far as it is required, should be simple, plain, and practical. Its theories should be kept in the background; its terminology and principles should be the reverse of the abstract. The contrasts and comparisons involved between the strange and the familiar, will stimulate and guide to the first beginnings of reflective grammar. The memory for words should be exercised and stimulated. Choice tales, poems narrative and lyric, should be learned for recitation. Natural history in all its branches, as contrasted with the objects before the eye—flowers, minerals, shells, birds, and beasts. These studies should all be mastered in the springtime of life, when the tastes are simple, the heart is fresh, and the eye is sharp and clear. The facts of history and geography should be fixed by repetition, and stored away in order.

But science of every kind, whether of language, of nature, of

the soul, or of God, *as science*, should not be prematurely taught; for the consequence is, either disgust and hostility to all study on the one hand, or, on the other, superficial thinking, presumptuous conceit, and, worst of all, sated curiosity.

The law of intellectual progress involves effort and discipline severely imposed and constantly maintained, but the effort and discipline should follow the guidance of nature. — *From Porter's Human Intellect.*

EDUCATIONAL MISCELLANY.

TEXTILE PLANT.—The value of *Laportea pustulata* as a textile plant is now occupying much attention in Germany. The plant, which is known in North America as the Wood Nettle, was discovered some years ago on the Alleghany Mountains, at an altitude of more than 5,000 feet above the sea level. Some living specimens which were brought home were disposed of to the Prussian Minister of Agriculture, who was desirous of ascertaining the value of the plant under cultivation. The results, so far, appear to be favorable. Being a perennial, the Laportea does not require to be sown every year, and in this respect has some advantages over hemp and flax; besides which, it is far less troublesome and less expensive than hemp in the preparation of its fibres. In the wild state it grows from two to three feet high; but as grown at Berlin, it has already reached a higher stature, which it is probable will be still more extended by careful cultivation in suitable soil. We may add that the plant grows rapidly, and is easily multiplied by division of the stools, or by root cuttings.

GARDENING FOR LADIES. — There is nothing better for wives and daughters, physically, than to have the care of a garden; a flowerpot, if nothing more. What is pleasanter than to spend a portion of every day in working among plants, watching their growth, and observing the opening of their flowers, from week to week, as the season advances? Then how much it adds to the enjoyment to know that your own hands have planted them and have pruned and trained them — this is a pleasure

that requires neither great riches nor profound knowledge. The advantages which woman personally derives from stirring the soil and sniffing the morning air, are freshness and beauty of cheek, and brightness of eye, cheerfulness of temper, vigor of mind, and purity of heart.—*H. B. Stowe.*

JUTE, OR GUNNY fibre is the produce of *Corchorus capsularis*, L. (natural order *Tiliaceæ*), an annual, growing from twelve to fourteen feet high. The fibre, which is contained in the bark, is generally about eight feet in length, and is obtained by treatment very similar to that adopted with the flax and hemp plants. Jute fibre is fine, and has a remarkable satiny lustre, so that it is sometimes mixed with the silk in the fabrication of cheap satins, and is very difficult to detect in the goods. Its chief use, however, is for making coarse canvas, or gunny, as it is called in India. When wet, jute fibre quickly rots, so that it is not adapted for the manufacture of either sail-cloth or cordage. The quantity imported to England in 1869, was 2,500,000 cwts.

ANTIQUITY OF FLAX.—Dr. Oswald Heer, of Munich, has published a paper "On Flax Culture in Pre-historic Times." He finds the original home of the flax to be along the shores of the Mediterranean. It can be shown that the plant was cultivated in Egypt five thousand years ago. Flax is found among the remains of the oldest pile-dwellings in the Swiss Lakes, where neither hemp nor wool has been discovered; and it is probable that the old Lake-dwellers received the flax plant from the South of Europe. The same species in question occurs on all our higher mountains of the Sierras; it is evidently an indigenous plant to the Pacific Coast.

INDUSTRIAL SCHOOLS.—Last year's report of the Egemouth School Gardens is worth the attention of everybody in any way connected with industrial schools. The Egemouth Garden contains 850 square yards, divided into ten plots, or small gardens, each cultivated by a single boy, from twelve to sixteen years old; the profits from this small patch amounted in the gross to £7 4*s* 6*d*, being at a rate of £41 13*s* per acre. These boys, who have had gardens from one to two, and four years, grow cabbages, potatoes, shallots, onions, leeks, greens, cauliflowers, and

rhubarb. The Industrial School of San Francisco ought to show similar results.

ASH-LEAVED MAPLE.—It is not generally known that the ash-leaved maple (*Negundo aceroides*) yields sugar. One third more of its sap for a given quantity of sugar is required than in the case of the sap of the sugar maple; but then the ash-leaved maple yields this extra quantity of sap, and as much sugar per season per tree can be produced from it as from the sugar maple. The quality of the sugar is the same from both trees, but that of the ash-leaved maple is a little lighter in appearance than that from the sugar maple. The method of sugar-making is identical with the method adopted with the sugar maple. This valuable tree occurs largely on the banks of our streams in the Coast ranges, especially towards the north. In Sacramento and San Francisco it is occasionally planted for a shade tree.

SYSTEMS of education, however perfect in method and all-embracing in range, will never supersede self instruction. If that were possible, indeed, there would be something to regret in the fact. Some of the most gratifying hours many of our ablest men have to look back upon are those which they have spent alone, grappling in their own way with the difficulties of a particular study. A great benefactor, no doubt, is he who writes a really good school book; but who shall tell the unexpressed gratitude which has been and ever will be felt for the man who can produce a book which will explain itself direct to the pupil, without the intervention of the teacher? It would be a misfortune if the great impulse in the cause of education, in the midst of which we are just now living, should lead our young people to rely too much upon the class-master. According to our experience, the boy who distinguishes himself at school and distances all competitors is he who forestalls the lesson of the day, and is a week or so ahead of his class and his task. School books should be so edited as to encourage efforts of that sort.

THE PRINCIPLE of class division in schools, sometimes called the Prussian System, is carried out in Prussia—at Berlin, for example—much as follows: the children are entirely taught in

class-rooms; the maximum number recommended in a room is sixty, seventy being considered an exceptional number. The class-rooms are oblong; it is indifferent whether they be lighted from the end or the side, but they must be lighted from one side only, and the children must have the light on their left hand. There seems no limit to the depth from front to back of a block of seats, but the length of each bench is so limited as to allow the master to inspect every child's work from the end of the bench. For the purpose of facilitating this inspection, a gangway is preserved all round the block of children, narrow at the back and at the side nearest the windows, but made wide enough next the wall facing the windows to be convenient for the ingress and egress of the children; and the block of seats is broken up into at least two masses, by an additional narrow gangway from front to back. No child ought to be more than thirty feet from the easel where diagrams, etc., are shown, and it is recommended that, as far as possible, the seat most remote from the window be not further from the wall than one and a half times the height of the top of the window from the floor. The master's desk, on a slightly raised platform, faces the block of children; an easel for the display of diagrams, etc., a book closet, and the stove or fireplace, occupy the space on either side of him. These class-rooms are ordinarily put together so as to form a compact block of buildings several stories in height, and are frequently divided on plan into three portions, by two staircases extending from front to rear; one of these is for boys and the other for girls. These staircases, however, often occupy the ends of the block, and sometimes a corridor connects them together; but this is sometimes omitted. On an upper floor and between the two staircases is placed the aula, or general room, calculated to seat about half the number of children provided for in the class-rooms. This room generally receives some amount of architectural decoration; it is not customary for it to be divided by movable partitions, or other means, when not in use for teaching. Private rooms for the teachers, and sometimes one or more consultation rooms, complete the essential parts of the building, which is heated and ventilated on a general system. It is recommended that as far as possible the class-rooms shall have a sunny aspect, and also, to secure greater freedom from noise, that as many as possible of them shall face the playgrounds rather than a main road.

[CORRECTION.—On page 77, the 14th and 15th lines from bottom should read, "first and second divisions of the third grade."]

DEPARTMENT OF PUBLIC INSTRUCTION.

OFFICE OF CONTROLLER OF STATE,
SACRAMENTO, Cal., August 4th, 1873.

Hon. H. N. BOLANDER, *Superintendent of Public Instruction:*

SIR:—In accordance with an Act of the Legislature, I have the honor to report as follows: The securities belonging to the School Fund, held in trust by the State Treasurer, consist of bonds of the State of California, bearing interest at legal rates, and amount to one million four hundred and seventeen thousand five hundred dollars ($1,417,500). The statement showing the moneys in the State Treasury subject to apportionment, and the sources from which the same were derived, is as follows:

Derived from poll taxes	$0 49
Interest on school lands	35,266 47
Interest on bonds held in trust	42,780 00
Property tax (four cents and eight mills on each one hundred dollars)	35,520 13
Subject to apportionment	$113,567 09

Very respectfully, JAMES J. GREEN, Controller.

APPORTIONMENT.

Total number of census children between five and fifteen years of age entitled to receive school money, 137,351. Amount per child, $0 82.

Alameda County, total, 6,496; amount, $5,326 72. Alpine, total, 103; amount, $84 46. Amador, total, 2,097; amount, $1,719 54. Butte, total, 2,623; amount, $2,150 86. Calaveras, total, 2,252; amount, $1,846 64. Colusa, total, 1,633; amount, $1,339 06. Contra Costa, total, 2,488; amount, $2,040 16. Del Norte, total, 315; amount, $258 30. El Dorado, total, 2,395; amount, $1,963 90. Fresno, total, 925; amount, $758 50. Humboldt, total, 1,939; amount, $1,589 98. Inyo, total, 259; amount, $212 38. Kern, total, 459; amount, $376 38. Klamath, total, 258; amount, $211 56. Lake, total, 1,000; amount, $820. Lassen, total, 440; amount, $360 80. Los Angeles, total, 6,173; amount, $5,061 86. Marin, total, 1,502; amount, $1,231 64. Mariposa, total, 875; amount, $717 50. Mendocino, total, 2,470; amount, $2,025 40. Merced, total, 908; amount, $744 56. Mono, total, 87; amount, $71 34. Monterey, total, 3,449; amount, $2,828 18. Napa, total, 2,068; amount, $1,695 76. Nevada, total, 4,179; amount, $3,426 78. Placer, total, 2,229; amount, $1,827 78. Plumas, total, 700; amount, $574. Sacramento, total, 5,622; amount, $4,610 04. San Bernardino, total, 1,583; amount, $1,298 06. San Diego, total, 1,407; amount, $1,153 74. San Francisco, total, 31,936; amount, $26,187 52. San Joaquin, total, 4,879; amount, $4,000 78. San Louis Obispo, total, 1,404; amount, $1,151 28. San Mateo, total, 1,908; amount, $1,564 56, Santa Barbara, total, 1,479; amount, $1,212 78. Santa Clara, total, 6,436; amount, $5,277 52. Santa Cruz, total, 2,696; amount, $2,210 72. Shasta, total, 1,277; amount, $1,047 14. Sierra, total, 1,009; amount, $827 38. Siskiyou, total, 2,250; amount, $1,845. Solano, total, 3,778; amount, $3,097 96. Sonoma, total, 6,127; amount, $5,024 14. Stanislaus, total, 1,508; amount, $1,236 56. Sutter, total, 1,313; amount, $1,076 66. Tehama, total, 1,148; amount, $941 36. Trinity, total, 508; amount, $416 56. Tulare, total, 1,514; amount, $1,241 48. Tuolumne, total, 1,912; amount, $1,567 84. Ventura, total, 822; amount, $674 01. Yolo, total, 2,101; amount, $1,722 82. Yuba, total, 2,412; amount, $1,977 84.

HENRY N. BOLANDER,
Superintendent of Public Instruction.

In deciding a question lately submitted to us, our attention has been called to the necessity of trustees keeping separate accounts of the State school fund and county school fund. In drawing an order on the County Superintendent, the trustees must state out of which of these two school funds said order is to be paid. Except this is done, County Superintendents are authorized to decline to recognize an order. In cases where the amount of an order drawn against a specified fund is in excess of the money on hand in such fund, the order should be returned to the trustees with the request to reduce the amount on said order to the amount on hand in the fund against which it is drawn, and to draw a second order for the balance due, against the other school fund. If, for instance, an order is presented calling for $185, to be paid out of the State school fund, in which only $167 are on hand, the amount of the order must be reduced to the latter figure in order to exhaust the State fund; the balance of the original order, $18, must be drawn against the county funds.

In order to enable trustees to draw orders in accordance with the above, County Superintendents must send them written notice of the amount placed to the credit of the district, whenever an apportionment is made, whether of State or county school money. Many County Superintendents neglect to do so, but simply publish the apportionment in the county papers. This cannot be considered sufficient notice as regards trustees.

The question has arisen that if, at the end of a school year, the county school fund has been exhausted, but a balance is on hand in the State school fund, whether this balance can be used only under the provisions of section sixteen hundred and twenty-two of the Political Code, whereby it can be used only for the purpose of paying teachers, or whether it can be used according to the provisions of the preceding section, under which it may then be used for the payment of claims against the district outstanding, or it may be used for the year succeeding. Section sixteen hundred and twenty-one specifies that the school moneys received from the State or county apportionment during any school year must be used exclusively for the support of schools for that school year; but in speaking of the use of a balance, said section draws no distinction between the funds from which this balance is left. It seems plain to us that this balance, whether it consist of county school money, or of State school money, or of both, may be used according to the provisions of section sixteen hundred and twenty-one. In such case, then, this State school money may be used for any of the purposes authorized for the use of county school moneys. But the best way will be for trustees to pay teachers first out of the State school fund until it is exhausted, and then draw against the county school fund. By this means all cause of dispute will be avoided.

A County Superintendent asks us whether a teacher's report, made on another than the prescribed blank, is legal. Subdivision four of section sixteen hundred and ninety-six emphatically declares that teachers must report to the County Superintendent at the time and in the manner and on the blanks prescribed by the Superintendent of Public Instruction.

We have repeatedly called the attention of County Superintendents to the necessity of sending, with each set of examination papers submitted to the State Board of Examination, a summary of the credits granted by the County Board. We have called the attention of Superintendents also to the necessity of sending *all* the papers

of an applicant, including the answers to the general questions, the answers in mental arithmetic, and the exercises and questions in reading, penmanship and oral grammar. We have also notified Superintendents that all papers not credited by the County Board, or incomplete papers, or incomplete sets, will not be accepted. Yet during June more than twenty sets of papers, in a total of thirty-five, were incomplete and unaccompanied by the proper summary of credits given by the County Board. There is no excuse for this; we furnish blanks on which to report to the State Board the standing of the candidate in each study. The blank shows, at the same time, in which studies a candidate must be examined. Below we give a copy of the blank. In the column headed "Credits on County Examination," are to be entered the credits given by the County Board; in the last column the State Board enters the results obtained on the re-examination of the papers. *The report must be endorsed with the name of the county whence sent.* County Superintendents are once more notified that unless a set of examination papers is accompanied by a "Report," and unless *all* the papers called for by the "Report," and also the answers to the "General Questions," are forwarded to the State Board, it will not be accepted by the State Board, but will immediately be returned to the sender. Examination papers must be sent either by Wells, Fargo & Co's Express, at the sender's cost, or by mail, *full letter postage prepaid*—three cents for every half an ounce or fraction thereof. Any set of papers not sufficiently prepaid will not be taken out of the Post Office.

REPORT OF COUNTY EXAMINATION FOR STATE CERTIFICATES.

Report of ———. To secure a first grade State certificate, 85 per cent. is required. To secure a second grade State certificate, 80 per cent. is required. To secure a third grade State certificate, 75 per cent. is required.

	Standard.	Credits on County Examinat'n.	Credits on State Examination.
Arithmetic, Written	100		
Mental Arithmetic (oral)	25		
Grammar, Written	100		
Oral Grammar	25		
Geography	100		
History of the United States	50		
Theory and Practice of Teaching	50		
Physiology	50		
Penmanship	25		
Natural History	50		
Composition	25		
Reading	50		
Orthography	50		
Defining (Word Analysis)	25		
Vocal Music	25		
Industrial Drawing	25		
Algebra	50		
Natural Philosophy	50		
Totals	875		
Percentages			

——— grade State certificate has been issued.

——— ———, Sec'y State Board of Examination.

Sacramento, ———, 187—

In applications for third grade State certificates, the last two studies, algebra and natural philosophy, must be stricken off, and the standard reduced by 100.

THE INSTRUCTION issued by the State Board of Education to County Boards of Examination, that applicants under eighteen years of age be not granted teachers' certificates, does not deter those persons under eighteen years of age from teaching who were holders of certificates previous to the passing of said instruction.

CHAS. H. ALLEN has been elected Principal of the California State Normal School, *vice* Dr. W. T. Lucky, removed. John H. Bealy was elected Vice-Principal, *vice* Prof. Allen, promoted.

EDUCATIONAL ITEMS.

THE STATE OF NEW JERSEY has made wonderful progress in her school affairs since the passage of the Free School law of 1871. Some of the most important features of this law are, the power it gives to levy and collect a general two-mill tax on all the property of the State, and the provisions requiring the election of County Superintendents, the keeping of the schools open at least *nine* months in the year, and the taking of a yearly school census of the children in the State, of school age. These provisions of law, in connection with the State Normal School, have brought New Jersey to the front rank in the common school work. In the length of her school term she is far ahead of Pennsylvania. The large State school fund, arising from the two-mill tax, enables her to outstrip us in this particular. This fund the past year amounted to $1,168,803 08; in this State the same rate of tax would yield, probably, $5,000,000. If we had such an amount to distribute among our school districts, they would no doubt gladly keep their schools open as long as they are kept open in New Jersey. Our plan, better than that of New Jersey in some respects, as time will show, is to support our schools mainly by local taxation, and the people of many districts are not yet ready of their own accord, unaided, to keep their schools open nine or ten months in a year.

WEST VIRGINIA.—The apportionment of the State school fund among the several counties for the year ending August 31st, 1872, was $237,215 85, being $62,319 26 more than the previous year; number of youths of school age, 170,000, being a gain over 1871 of 3,289; amount disbursed in 1872, $171,560 05; amount due the several counties October 1st, 1872, $230,843 84; number of school districts, 2,411; high schools, 3; graded schools, 64; common, 2,412; total schools, 2,479; number of teachers' certificates, No. 1, 649; No. 2, 840; No. 3, 560; No. 4, 330; No. 5, 127; total, 2,506; number rejected, 20; number of applicants rejected, 129. Whole number of pupils enrolled, 153,916; number attending school, males, 46,745; females, 39,020; total, 85,765; daily average, 56,317. Total value of all school property in in the State, $892,276 31. Total expenditure of the building fund in the State, $124,791 42. Total receipts for schools from the State, $134,666 58; from levy, $366,120 58; total, $500,787 16; amount of salaries to males, $285,598 18; females, $91,484 07. Paid for apparatus, $1,901 29; commissions, $9,161 93; contingencies, $17,140 84. Average salary per month, males, $35 04; females, $28 98.

KANSAS.—Number of teachers employed, 3,795. The average monthly salary of gentlemen is $40 20, while ladies receive only $31 50; and yet the latter undoubtedly do as thorough work as the former. The average time school has been taught is 5.4 months. $3,124,390 09 is the estimated value of school property in the State. The year closes with a surplus in the treasury of $220,669 90.

KENTUCKY.—There has been an evident increase of educational activity during the past year. Of the 5,381 schools in the commonwealth, 5,308 have been taught. The total number of pupil children reported is 416,763—an increase of 10,923.

MINNESOTA.—There has been no radical change in the work of the schools within the past year. The present system, as yet imperfectly developed, owing mainly to the youth of the State, is gradually unfolding itself, and as more tangible results follow, errors are corrected, improvements made, and a better confidence established. Whole number of persons in the State between 5 and 21 years of age, in 1872, 180,020; increase for the year, 11,275. Whole number of different persons attending

school in 1871, 113,983; whole number of different persons attending school in 1872, 120,352; increase for the year, 9,369. Whole number not attending school in 1871, 53,480; whole number not attending school in 1872, 59,668; increase, 6,188.

RHODE ISLAND.—In this State, as in almost every other, the question of compulsory education is receiving increased attention. Among superintendents the opinion is general, that there should be some legislation to compel every child to attend school. In Rhode Island the number of absentees amounts to 4,200; the whole number of population between the ages of five and fifteen years is 42,000; the average attendance at Winter schools was 28,702, while at Summer schools it was only 21,805. The total receipts during the past year were $496,906 41, and the expenditures amounted to $465,623 63. The first year's history of the State Normal School has been one of successful labor, and has clearly proved the wisdom of its establishment. At the opening of the school in September, 1871, the number of applicants for admission was larger than the best accommodations, then furnished, could supply; and at the commencement of the second school year the Board have found it necessary to enlarge the sitting capacity of the school, to receive the large class which sought admission. This gives cause for congratulation, from the fact that the number which seek for Normal instruction is undiminished, and also from the fact that such confidence has already been established in the public mind, with reference to the excellent working of the school.

VERMONT.—Number of persons between the ages of five and fifteen years, 53,714; number of schoolhouses, 2,402; number of male teachers, 684, of females, 3,467. Very full statistics are given in the last report. We learn, for example, that 211 districts own "Webster's Unabridged," 293 own globes, 217 school houses have clocks, while only 75 are provided with thermometers. These statistics are for 1871, the report being biennial. In 1872 the number of children between five and fifteen years of age had increased to 89,999. Number of common schools, 2,503—an increase of 101. There is a decrease of 13 in the number of male teachers, and an increase of 77 female teachers. In 1872, 1,313 teachers "boarded around," a decrease of 20 since the previous year. In the matter of dictionaries and thermometers there is a decided falling off. $85,724 99 were expended for new school buildings in 1872, and the estimated value of the school property is $1,265,387.

WISCONSIN.—The total between the ages of four and twenty years is 423,717. Of these, 270,292 attended public schools, and 22,051 were cared for in private institutions. The large number of absentees in this State—131,374—is partly accounted for by the wide range of the legal school age, from four to twenty years. In cities, the average wages of male teachers have decreased from $1,053 to $982, while those of female teachers have increased from $367 to $376. There is a growing disposition to retain those ladies who give satisfaction in the schools, and to advance their wages with increase of experience. The number of good school houses increases every year.

DIFFERENT ALPHABETS.—The Sandwich Island has twelve letters; the Burmese, nineteen; the Italian, twenty; the Bengalese, twenty-one; the Hebrew, Syriac, Chaldee, Samaritan and Latin, twenty-two each; the French, twenty-three; the Greek, twenty-four; the German and Dutch, twenty-six each; the Spanish and Slavonic, twenty-seven each; the Arabic, twenty-eight; the Persian and Coptic, thirty-two; the Georgian, thirty-five; the Armenian, thirty-eight; the Russian, forty-one; the Muscovite, forty-three; the Sanscrit and Japanese, fifty each; the Ethiopic and Tartarian, two hundred and two each.

POPULATION OF THE GLOBE.—There are on the globe 1,288,000,000 souls, of which 360,000,000 are Caucasians; 522,000,000 are Mongolians; 190,000,000 are Ethiopians; 176,000,000 are Malayans, and 1,000,000 are Indo-Americans. There are 8,642 languages spoken, and 1,000 religions. The yearly mortality of the globe is 42,043,000 persons; that is at the rate of 115,200 per day, 4,800 per hour, 80 per minute. Among 10,000 persons, one arrives at the age of 100; one in 500 attains the age of 80; one in 100 to the age of 70. In 100 persons, 95 marry.

BOOK NOTICES.

A GRAMMAR OF THE LATIN LANGUAGE. By G. K. Bartholomew. Cincinnati and New York: Wilson, Hinkle & Co.

Though not so pretentious as many of the grammars already before the public, Mr. Bartholomew's work will be found really more serviceable for teaching Latin. The Roman pronunciation is adopted, in accordance with the recommendations of the professors of Latin in the English Universities, and of Harvard University and other leading American colleges. The inflection of the verb is presented before the inflections of the noun—a preferable arrangement. Unusually large space is given to the illustration of the formation of words, in recognition of the growing importance of this branch of Latin study. In short, the whole work shows that the most important results of recent philological researches have been duly considered, and that the grammar has been prepared in accordance with the wants of the class room.

MISS BEECHER'S HOUSEKEEPER AND HEALTH-KEEPER. New York: Harper & Bros. San Francisco: A. L. Bancroft & Co.

This work contains five hundred recipes for economical and healthful cooking, and many directions for securing health and happiness, and has been approved by physicians of all classes. From the marketing, the care and preparation of all kinds of food and drink, to the providing and care of family stores; from the setting of tables to washing, ironing and cleansing; from "How to keep cool in Hot Weather" to "How to get rid of Rats and Mice;" from the needful science and training for the family, the building and furnishing of a healthful and economical house, to economic modes of beautifying a home; from the preservation of good temper in a housekeeper to the care of the aged, of domestic animals, of the sick, of rooms, of yards and gardens, of infants, of servants, to sewing, cutting and fitting, accidents and antidotes, right use of time and property, domestic amusements and social duties—in short, anything that in any way may be conducive to make woman's work in the household agreeable, tasteful, and promotive of both grace and beauty of person, and to make a happy *home* for husband and children, receives due consideration. The work is what the author claims it to be—"a complete encyclopedia of all that relates to a woman's duties as housekeeper, wife, mother and nurse."

FOURTEEN WEEKS IN CHEMISTRY. By J. Dorman Steele. New York and Chicago: A. S. Barnes & Co.

We do not know how, with the many excellent text-books in chemistry already before the public, "Fourteen Weeks in Chemistry" could ever aspire to the dignity of a text-book. The task which the author sets himself is the humble one of expressing, in simple, interesting language, a few of the principles and practical applications of chemistry. How indifferently qualified he is for this task will be seen from the bad treatment of the subject, the general clumsiness and obscurity of expression, when he ventures upon any original statement, and his utter failure to comprehend which of the principles of chemistry are of importance to the general student. Even when adhering slavishly to the authorities from which the principal material has been compiled, the text is so warped, abridged or changed, that it utterly fails of its object. The author lays no claim to originality, but we do hope that most of the definitions are original. In fact we wish that every definition may be copyrighted, and its use by other authors strictly interdicted, so that by the time that "Fourteen Weeks in Chemistry" has sunk into its well-deserved oblivion, no remembrance of its definitions may vex the mind of man. To give only a single quotation: "The atomic weight of

an element expresses the proportion by weight in which it unites with other elements." Now all but monovalent elements combine in more than one proportion with either the same or different elements. Which of these proportions is the atomic weight? Which of the principles of chemistry is of more importance to the general student as well as to the chemist, than the theory of the valence of elements? Yet all mention and consideration of this theory is studiously avoided. The author has completely failed in explaining the elementary principles of chemistry, and in elucidating and deducing them from experiments. In short, the book seems to be written with the sole object of enabling teachers to cram pupils within a certain limited time with a certain quota of chemical jargon; the true pedant's method of substituting words for facts, definitions for experiments, and sound for knowledge.

SCRIBNER'S MONTHLY.

The August number opens with a good, profusely illustrated article on Nantucket. California scenery is represented by a well written article on "Mount Shasta," and "My Day in the Wilderness," a spicy narrative of the difficulties experienced in passing from the Yosemite Valley to Gentry's by the old Mono trail. An article which will be welcomed by all lovers of birds and woods, is "The Blue-bird," by Mr. Burroughs. "The Canopus Stone," "Modern Skepticism," and "Pundits" are articles which will be of special interest to some of our readers. Bret Harte's promised article, "An Episode of Fiddletown," opens very promisingly. Such an article as Trowbridge's "Fred. Trover's Little Iron-clad" we did not expect to see admitted in Scribner's. Of poetry, the most generally interesting is John Hay's version of one of the best of the Buddhaghosha's parables. George MacDonald is represented by "A Spiritual Song," a capital translation from the German of Novalis, and E. C. Stedman by "Beyond the Portals." Dr. Holland's Topics of the Time are entitled "The Morals of Journalism," "A Reply to many Letters," and "The Liquor Interest." In The Old Cabinet we find "The Flaw in the Jewel," "I Met a Traveler on the Road," and "A Sower went forth to Sow." Home and Society treats of "Dinner-Giving," "The Abuse of Appetite," "The Habit of Reading," "Ready-made Garments," and "The Fashion in Jewelry." The other departments are as varied as usual.

OVERLAND MONTHLY.

Now that so many are flocking for recreation and health to the mountains, John Muir's article, "Explorations in the Great Tuolumne Cañon" is the most seasonable article in the August number of the *Overland*. The description is enough to drive all lovers of nature wild. Stephen Powers' article on "The Yocuts" is the best of his articles on the California Indians which have yet appeared. "South of the Boundary Line" gives a faithful description of La Frontera, the northern political division of Lower California. A very readable article is given regarding the London Art Exhibition of 1873. Charles Warren Stoddard contributes a very characteristic sketch of "Love-Life in a Lanai." "Number 119" partakes of the supernatural. Ina D. Coolbrith, sweetest of poetic contributors to the *Overland*, gives us "Leaf and Blade." Etc. treats of "Blunders," "Chinese Views of the Pigtail Ordinance," and "Our Superior Civilization." "Current Literature" is fuller and more readable than we have seen it for some time.

OUR EDUCATIONAL EXCHANGES.

The *Educational Journal of Virginia* opens its August number with a seasonable article on the evil effects of overtasking the minds of children, by Dr. J. L. Cabell, the President of the State Board of Health. The other articles, except one copied from an exchange, are of local interest. In the Department of Public Instruction, reference is made to the desirableness of a graded course for schools of one teacher. California receives in this connection the following notice: "The California State Board of Education has boldly issued a graded course for all the schools of the State, and all officers and teachers are required to adopt and enforce it without exception. The experiment will be watched with interest by educators generally." While on this subject, we give a quotation also from the *Ohio Educational Monthly*, which, speaking of the action of the State Board of California, in prescribing a uniform graded course of studies for all the schools of the State, calls it "a bold movement, and, if successful, California will have the honor of settling the feasibility of a definite course of study and instruction in ungraded schools;" and after giving a synopsis of it, it calls the course "well-arranged."

The July number of the *National Normal* is the last one which has come to hand. The *Normal* has become famous for its short, incisive editorials on educational matters; and the way in which some of the foibles and short-comings of teachers are handled is highly interesting to those who are not "hit." The short articles headed "Professional," present epitomes of rules of conduct and instruction, which teachers would do well to keep constantly before them. The "Intelligence Department," the most characteristic feature of the *Normal*, gives brief notices of the most important educational news and movements in the different States. Unfortunately, the information must be sometimes very unreliable, if we are to judge by some of the notices coming from California.

The *New York State Educational Journal*, though not yet a year old, has already taken a high stand among educational journals. Some of the best articles we have lately read on educational subjects have appeared in its pages. On looking over our files we miss the July and August numbers. Will our contemporary please supply these missing numbers?

The *Iowa School Journal*, of which the August number is not yet to hand, is doing a good work in giving its readers so many articles on the practical questions of the schoolroom. In the July number appears a sensible editorial on the principle of "Supervision," which we shall perhaps reprint for the benefit of our readers.

Its editorials place the *Ohio Educational Monthly* in the front rank among educational journals. One of the ablest reviews we have seen of the various methods of conducting recitations appears in the editorial department of the July number. Of the leading articles for July, "The Kinder-garten" is the best, and one of the most valuable we have lately seen on the subject. In the same number, Mr. Henkle astonishes us somewhat with the number of words he has found which are not included even in our 104,000 and 114,000 words dictionaries.

Home and School, published by Jno. P. Morton & Co., Louisville, Ky., as its name indicates, is intended for the fireside as well as for the teacher's desk. Whenever needed, the articles are illustrated—one of the many advantages enjoyed by a journal having the resources of a large book-publishing house. To show the scope of this monthly, we give the contents of the July number: A philosophical article on "The Influence of the Mind upon the Body," from the pen of the elder Yandell, opens the number; "As you would be Forgiven," by Miss Barnwell; Dr. Fontaine describes the works of the Mound-builders in Mississippi; Miss Eells has a practical paper on "Reading," for teachers of primary classes; Prof. Richardson has a paper (illustrated) for professors of mathematics, on "Maxima and Minima;" Mrs. Gittings

sketches the perils and pleasures of the Alpine tourist; Mrs. Henry contributes another chapter of Alabama history; Paul Hayne furnishes the poetry; the editorial notes are full of good things pertaining to general education, literature, and science.

The July number of the *West Virginia Educational Journal* is filled with a good selection of original and selected articles. It copies the article on "Fundamental Principles of Teaching Language," published in the June number of the CALIFORNIA TEACHER. The *Journal* will close its first volume with the August number.

What has become of the *Minnesota Teacher?* January, February and May are the only numbers received this year.

The principal articles in the *American Educational Monthly* for August are "School Houses for the Country," "Errors in the Use of Prepositions," and "The Structure of the Appalachian Zone." The distinguishing features of this monthly are carefully compiled Geographical Notes, and Educational Intelligence. The former are invaluable in the school-room.

TO TEACHERS AND SCHOOL OFFICERS.—We have for sale at this office a few copies of the Educational Year Book, for 1873, published by Wm. Wood & Co., of New York. It is printed on heavy, tinted paper, in clear type, and substantially and tastefully bound. It is a handbook of reference, comprising a digest of American public school laws, systems of instruction, and interesting matters pertaining to schools and colleges, ranging from professional anecdotes to educational statistics. The work has been commended by the most prominent educators throughout the country. Price, $1 25; sent, post paid, on receipt of price. Address,

THE CALIFORNIA TEACHER, Sacramento.

RECREATION—THE SCHOOL STAGE. Messrs. Wilson, Hinkle & Co. (Cincinnati and New York), have just published *Venable's School Stage*, a Collection of Juvenile Acting Plays, for school and home. Sent by mail postpaid on receipt of price, $1 25. A fuller announcement will appear in the next number of this journal.

OFFICIALLY RECOMMENDED.

HOTZE'S FIRST LESSONS IN PHYSICS.

An elementary work on Natural Philosophy for First and Second Grades.

Retail Price **$1.00**
For Introduction or Examination **60**

Extract from the new Course of Study adopted by the California State Board of Education, February 14th, 1873:

"NATURAL PHILOSOPHY. Oral, or, at the option of the teacher, ***Hotze's First Lessons in Physics.***"

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HOTZE'S FIRST LESSONS IN PHYSIOLOGY
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THE

CALIFORNIA TEACHER.

OCTOBER, 1873.

VOL. XI. SACRAMENTO. No. 4.

NORMAL SCHOOL.

At the meeting of the Trustees of the State Normal School held in San Jose, August 9th, 1873, the following general plan for the work of the Normal School was presented by Prof. Chas. H. Allen, the newly elected Principal. The report, except so much as relates to tuition, was adopted by the Board.

As this plan embodies what we may hope to be the future work of the school, we publish it entire, as furnishing to those interested a condensed statement of the designs of the school, and the means to be employed in accomplishing them.

GENTLEMEN OF THE BOARD OF TRUSTEES:—In compliance with your request, transmitted to me with notice of my election to the principalship of the California State Normal School, I beg leave to submit the following suggestions, as an indication of what I conceive to be the proper work of the school. For the sake of brevity and that the points may be the more easily considered, I have condensed them into distinct propositions.

I. The Normal School classes shall be so organized and conducted as to give to the pupils a thorough and critical knowledge of the branches which they will be called upon to teach in the public schools.

II. The pupils are also to receive constant training in "Methods of Instruction," embracing the normal, or natural method

of imparting knowledge, and securing mental growth and development. Connected with this, instruction in classifying, grading, and organizing schools, in means of securing discipline, and methods of conducting class recitations and general exercises.

III. They are also to acquire so much of the laws of mind (Mental Philosophy), as will enable them to understand the "Philosophy of Teaching," so that in their teaching they need not become mere copyists of the methods of others, but, understanding the nature and purposes of the work, shall be able to originate and put in practice new methods, to meet new circumstances that must be constantly arising.

IV. After having received this instruction, and even while receiving it, they are to begin practice-teaching in the Training School, where the theories received may be tested by practice, and where, under rigid yet kindly criticism, they may be trained to avoid objectionable mannerism, and acquire facility in the use of methods, as well as in the use of all necessary illustrative apparatus.

V. So far as it can be done, and not neglect the foregoing, pupils may pursue more advanced studies, in all cases giving preference to those that will best fit them to do well the proper work of the school room. These will, in most cases, be those required to obtain certificates of a higher grade.

VI. Final, in all its arrangements the Normal School should be so organized and conducted as to be a "*Model School*" in its truest sense. The instruction should be such as to secure a modest self-confidence and self-reliance, as far removed from timidity and over anxiety on the one hand, as from opinionated pedantry on the other. The discipline and influence to be such, in every particular, as will tend toward developing honest, independent, self-possessed men and women; men and women who, while they are ever mindful of the rights and feelings of others, will be fearless workers in the cause of popular education, ever ready to sacrifice immediate advancement, gain, or gratification, for the lasting good of those with whom they may be associated.

In regard to the training, or model school, that most difficult, most unsettled, and in many cases most unsatisfactory, yet necessary adjunct of a Normal School, I unhesitatingly recom-

mend the following, as being, under the circumstances, best adapted to the wants of your Normal School. You will perhaps permit me to premise by saying, that my recommendations are based upon a somewhat extended experience, and a wide observation of the various plans carried out in other and older institutions of a similar character.

I. The two additional classes established by the recent action of the Board should be arranged for and admitted immediately. This will give us three grades of scholars, corresponding very nearly to the *four* lower grades in the public schools of the State.

II. At as early a day as possible, two other grades should be opened, completing the full grade, from the lowest grade admitted in the training school to the lowest class in the Normal School, the highest class to be designated the preparatory class. This will subserve two ends. First—It will afford an opportunity to all members of the senior class in the Normal School to work in the training school, with classes in all grades that are to be found in the public schools. Second—It will provide a proper place for the instruction of those pupils who are constantly coming to the Normal School, many of them from a distance, and who are not far enough advanced to be admitted into the regular classes.

III. A regular course of training and study should be prepared for the training school and preparatory class, embracing all grades from the lowest primary to the Normal School junior class, and the pupils should be graded and promoted upon examination.

IV. The present principal of the training school can, for the present, be put in charge of all the classes thus far established, and, with suitable recitation rooms, the teaching can be done by the Senior class in the Normal School.

V. The preparatory class will require a principal, and a separate organization, as there will necessarily be many modifications in the teaching and discipline of that department, to adapt it to its preparatory work.

VI. That all these departments may be under the full control of this Board, and to avoid any unpleasantness in reference to admission, course of study, or discipline, it seems best that the Normal School should meet all the expense for preparing and

seating rooms, apparatus and instruction, and that pupils entering the training school be charged a reasonable tuition. This tuition would gradually defray all the expense of fitting up the rooms, and, I believe, soon meet all the current expenses of the training school.

In conclusion, gentlemen, allow me to add, that in submitting the foregoing it is not my purpose to reflect in any way upon the manner in which the school has been organized and conducted, but rather to give an outline of the work which you have the right to expect from your Normal School.

Since preparing the above, arrangements have been completed with the Board of Education of the City of San Jose, by which about one hundred and twenty pupils from the grades of the city schools are to be taught in the training school. It is, perhaps, not saying too much to add that the changes made and contemplated will greatly increase the efficiency of our State Normal School.

CIRCULATION OF WATERS ON SURFACE OF THE EARTH.

II.

But what is the nature of the motion of the waters at their ebb and flow? progressive or oscillating? The water of a river flows, that is, the following particles take the place of those gone before, as we can clearly see by any body floating on the surface. The case alters with the billowy ocean. A vessel does not float along on the crest of the wave; it rises on it, but then sinks down again into the watery valley without any change of position. When the wind sweeps along a field of corn, every blade bends before the pressure, to rise again afterwards. The wave that skims along the surface is formed by a continuity of blades; in the same manner the water rises and falls in succession at different places, and this succession appears to us like a lateral progress. The motion of the sea is exactly like that of the little wooden pegs in the inside of a piano, when we pass our hand rapidly over the keys. The undulatory motion of the sea is to the flowing stream what the transmission o

sound is to the wind. It is easy to understand, therefore, why the tumultuous ocean can as little drive a mill wheel as a cannonade can set a windmill in motion. The wave and the sound are vibratory motions, with this difference, that in the sound the atmospheric particles rather hold off from the sound-producing body, and afterwards return to their places; while the water takes a perpendicular motion in the direction of the progressive wave. This latter motion, produced by a rising and falling, is hence termed a transverse or oblique vibration; the former, caused by a swaying backwards and forwards, a longitudinal vibration. What has just been said of the water, merely applies to those short, chopping waves raised by the wind, the height of which is considerable as compared with the transverse section, and not of those tidal ..., which are very low in comparison with their immense cross section. In the latter, the perpendicular motion is not rectilinear, but the preponderating vertical direction, accompanied by a little lateral push, which we detect in the shock of the beating wave. This produces an elliptical motion of the watery particles, the long axis of those ellipses being almost vertical, having only a slight inclination, and the short one horizontal. The tidal wave, therefore, in its motion, more resembles that of the atmospheric particles, than the drops in a watery wave agitated by the wind. The oscillatory motion of the water at high tide may hence be termed progressive-longitudinal, the height of the tide, which represents ebb and flood, being inconsiderable in comparison with the lateral motion.

The reasons of the origin of this lateral motion are not difficult to explain. Let *a*, *b*, *c*, *d*, stand for the points of the transverse section of two successive meridians perpendicular to the equator; the sun, on the days it crosses the equinox, stands within the four and twenty hours vertically over these four points in succession, in the following manner—taking *m* as a centre:

$$\begin{array}{cccc} a\ b\ c\ d, & a\ b\ c\ d, & a\ b\ c\ d, & a\ b\ c\ d, \\ m & m & m & m \end{array}$$

In the first case *d* will show the strongest inclination to approach; if *c* is liquid, it will try to move in the direction *cm*; but if solid, then it can only move parallel with the motion of

the centre-point of the earth, or in other words, parallel with *dm*. A lateral motion towards *d* is thereby imparted to a liquid body resting over *c*. In the second case a solid and a liquid *c* move in the direction *cm*, but with different degrees of velocity. The fluid is raised, but accepts no lateral motion. In the third, *b* moves towards *m*, a liquid *c* in the direction *cm*, a solid, in that parallel to *bm*. Again we have a lateral motion, but opposed to that in the first case, namely towards *b*. This also holds good for that half of the earth turned from us. We see, therefore, that on both sides of the meridian over which stands the celestial body to which we are indebted for the flood, the water flows towards it; consequently, two ebbs bound laterally the two flood masses; and so, on either side, the water makes a lateral oscillating movement.

Were the surface of the earth everywhere covered with an equally deep sea, a very broad double-wave would go round the earth from east to west within twenty-five hours, it being highest at the equator, and sloping quite away at the poles. Something resembling this is to be seen in the South Seas, where the land retreats almost wholly. The phenomenon, however, shows an essentially different aspect in the Pacific, Indian, and Atlantic oceans. In each of those waters, a new tidal wave always arises at the east coast, which is reflected on the west coast before a second primary wave has time to form. If you pass a violin bow over the sounding board, the bow, sweeping down, calls forth on the margin of this elastic board inflections which progress over it like waves, and return reflected from the margin. The more equal the intervals are which are set in motion by the bow, the more regular will be the meeting of the wavelets in their passage hither and thither; the progressive vibrations are soon changed into standing ones, when all the parts of the sounding-board vibrate simultaneously round their centre of gravity. Let us now compare the sun and moon, the bodies which influence our tides, with the light bow, and those vast ocean hollows or basins with the elastic sounding-board. Now it is not improbable that a broad arm of the sea be made to oscillate like the water in a glass, when pushed rapidly backwards and forwards on the table, with your hand. Just as this oscillating water rises and falls most at the edges, and changes its

position least in the centre, just so will the ebb and flood be stronger at the coasts than at an island in the middle of the sea. After having long asked how it would be with the ebb and flood in an ocean equally deep everywhere, and surrounding the whole earth, in the answer, of course only a theoretic one, a new step forwards has recently been made, by seeking to determine by experimental observations, what aspect the phenomenon exhibits on the actual oceans of the earth. The result there has confirmed the fact, that the flood in America indeed comes from the east, but in Africa and Europe from the west. If the tidal wave enters a narrowing bay, it is heaved higher, but if it flows round a larger island, it may possibly be delayed so long on its way, as to come rolling in when the other part of the wave is already on the turn. Just as on a sounding board, when a water mountain and a water valley meet, there occur lines of rest. In the German ocean there is a spot where the waves pressing through the Channel, meeting that branch of the great Atlantic tidal wave coming down from Scotland, completely absorbs the flood. The grandest accumulation is to be seen in America, in the Bay of Fundy, in the rear of which there is sometimes a difference of a hundred feet in the level. If the Baltic had such flood, Berlin would at certain times be a maritime town, for the pavement of Dorotheen street, near the old observatory, lies exactly a hundred feet above the zero of the water-mark in Swinemünde. But the Baltic is so perfectly enclosed by Denmark, that not till a few years ago did the Mecklenburgers succeed in proving that it *has* a flood, though to be sure but of a few inches. How grand, on the other hand, are the appearances on the west coasts of Europe. We can scarcely believe the testimony of our eyes, when we behold children in Ostend playing at the Digue on the dry strand, building their fortresses of sand, where but six hours later the bathers are disporting in the waters; or when, from the cliffs at Bristol, at the ebb, you see a dog running through the stream at that place where the omnibuses are already stopping to pick up the passengers from the steamers; when, on the line from Chester to Anglesea, the wide bay of the Dee is drained, where six hours later, returning from the Britannia Bridge, you see proud vessels afloat; or where, at the ebb, you can walk round

Heligoland dry shod, where at high tide the surge breaks on the rocks with the din of thunder. The Scandinavian coast dips so abruptly into the sea, that its cross-valleys, filling with its waters, form the fiords. The water that the high tide has carried up, rushes back at low tide with such violence that it has been said, though with much exaggeration, that Norway is a country where the ocean forms cataracts. If they are not cataracts, they are at least dangerous whirlpools, of which the maelstrom is the best known.

And what is the final result of this ceaseless, restless tossing? The effect is the most visible in the polar sea, in the unceasing breaking up of the masses of ice, the enormous pressure of which the strongest vessels are often unable to withstand; the beneficial result, however, is that passages are opened up into territories which would otherwise be locked in by an impenetrable wall of ice. The result of this thousand years' friction on our own coasts, is likewise visible in our sandy sea beach. If we try to calculate the value of the labor requisite to grind down solid blocks of rock to such minute grains, what company of shareholders would undertake to produce even the moderate quantity of sand on which Berlin is built? The reason of the great mechanical power lies herein, that the waves raised by the wind being only superficial, penetrate but little below the surface, while the force which produces the flood acts on the whole body of water. A tidal wave which rises three feet at the equator, and slopes away regularly towards the poles, bears two hundred cubic miles of water from one quarter of the earth to the other, and in six hours. If this volume seems trifling to the aggregate body of water on the earth, which Herschel computed at the 1786th part of the bulk of the earth, still the force necessary to move such a volume over such a space is not despicable, when we remember that one cubic foot of water weighs sixty-six lbs. Prussian (half a kilogram.) But how high must the tides have been when the whole earth was in a liquid state! If the first clods which solidified united to form a connected crust, then the tides must have beat them more wildly together than now in the polar seas. Is it to be wondered at, if there are everywhere traces to be found in the crystalline primitive rocks, of vast havoc and destruction, even there where they have not pushed

their way into the shattered covering which holds the strata bound together? Such traces must be most distinctly visible in the equatorial regions, because there the vertical action of the heavenly bodies must have been much greater on the flood of a still quite liquid earth.

The knowledge whether the internal liquid ocean of fire is fluid, or whether, moreover, viscous, is hidden from us. Like the visible wave on the shore, perhaps it works its way, pushing and destroying at the firm crust, on which we can often clearly trace the marks of those progressive waves which we call earthquakes. This crust is certainly plastic and pliable. Does not Sweden rise before our eyes out of the sea, which incessantly retreats from its coasts, while on the Pomeranian shores no such change is visible? In other places does not the land sink, as for instance in Istria, where Roman pavements are to be found below the present level of the ocean? Have we not, through Darwin, almost attained the certainty that the report of a sunk Atlantis is realized in the main idea, in the Pacific Ocean; where the great Australian coral reef, that no doubt once touched the coast, though now cut off from it by many a mile between, repeats the line of the coast in a great curve of some five hundred miles in extent; and where hundreds of coral rings — a lagoon in the middle — still mark out the expanse covered by the islands long ago engulfed; while the corallines are laboring unweariedly on the yielding bottom, to keep up a connection with the surface of the ocean? Their activity will not come to an end, nor the whole colony become a dead rocky mass, till the bottom of the sea rises up high and dry as so many of our mountain ranges, which, under the names of Mount Jura and the Rauhe Alp, stretch like a wall of fortification, from the southwest frontier of Switzerland, away into the region of Bayreuth.

[*For the California Teacher.*]

CRUMBS OF LITERATURE.

II.

There is a very familiar little anecdote, no doubt most of our boys and girls have read it in the funny columns of the news-

papers, which gives us a glimpse of two great men—Pope, "the little crooked thing that asks questions;" and Johnson, "the bear," who gave the definition.

Rasselas is not read in this generation, but no doubt our pupils have heard of the "Dictionary man," and would be interested to have the anecdote tacked on to him, so that they could feel acquainted. And if they could get some little glimpses of his good life, how honored they would feel with his acquaintance. That heart of his was as large, as Pope's was small; his life was full of struggles with poverty and sickness, yet free from stain or reproach; self-abnegation was to him no virtue, only a simple duty; as soon as he possessed a home, he filled it with the halt, the blind, the sick—those poor weary ones who had "nowhere to go"—and he was glad to be able to bear the burden of their support for years, until death showed them a better refuge. He bore his many trials with a perfect resignation, which is as far above the stoicism of Heathen philosophy as the perfect statue of Phidias is above the dull stone from which it is wrought. His was a life-time battle; surely History has no greater hero. Rough, domineering, awkward, impatient; ponderous and unwieldy of mind and body; he yet had charity, "which vaunteth not itself," dignity without affectation, and genius without vanity.

We could tell of the boy who was growing to manhood among the "bonnie braes" of Scotland, while Johnson was growing old and slowly dying in England. The boy who was possessed of so true a heaven-born genius, that even to their young minds the literature of Du Chaillu, and Southworth, and Heutz would seem poor and tasteless beside it. This peasant boy, this poet-ploughman, this Robert Burns, was a mosaic of humor and pathos, fire and tenderness, all vivified and blended by that mysterious something, without which all is naught. Alas! that all worldly prudence was left out of his composition; that his delicate frame should have been burned and ruined by intemperance, his fine mind been inert, his tender heart ceased to beat at the age of thirty-five. He had true pride and true dignity; both energy and application, and a warmth and benevolence of heart, which endear his poems to us beyond all others.

If it did not *hurt* us to do so, we could hold him up as a warn-

ing to their straying young feet. He did not, like Chatterton, die alone in a great city, for want of the very bread to sustain life; no! friends were about Burns, almost too eager to assist him; the pet of fashionable, the lion of literary society, he lived in a constant struggle with poverty, and died in its terrible clutches. "Ah! puir Robie," said an old woman, when she heard of the fine monument about to be erected to his memory, "puir, puir Robie; ye asked for bread, and they hae given ye a stane!"

We would no doubt find many among our pupils who have read the Waverley novels; not very appreciatively, perhaps, but for the sake of the story; but however, let us rejoice over them, for that is better than nothing. Among some girls, nothing is quite so "perfectly splendid" as The Little Beauty: or, The Lost Bride. I doubt if that ecstatic form of praise could or would be applied to any book which did not have a superabundance of love and jealousy, and above all, a *bride* in it. Having read the books, would they not like to hear of the author? That "Lazy Division" which forms no small portion of our classes, would find in him one blessed attraction—he was not the least bit of a prodigy! Not *quite* a dunce, perhaps, but a good-hearted, merry boy, who hated his books and loved his play, even as they do. Who tumbled into scrapes, and out, obtained such knowledge as he couldn't help swallowing with the aid of a birch rod, and only such, and so at last was surprised to find manhood upon him and life-duties close in his pathway, even as they will do. His native land may indeed be grateful to Walter Scott, as well as proud of him: for it was his hand which opened to the world the vast treasure-house of the Border ballads; awakened to new life the memory of her forgotten heroes, and painted the then almost unknown scenery of her lakes and mountains in a thousand eloquent pictures. And his character is so noble, so *good*, that it makes us think better of humanity; he, dear man, had many a pleasant weakness, many a human foible, so that he seems quite near to us; and he had, too, so high a sense of honor, such wonderful determination, such a prodigal genius, that he seems to elevate all mankind through his own virtues. Ah! Arthur Wellesley, and Frederick of Prussia, and all you great heroes, methinks your laurels fade

a little before this lame old man, who left the home for which he had labored all his life, and the country splendor he loved so well, and retreated to the cramped rooms and close air of the hated city, there to pay off, by his single, unaided effort, a debt of two hundred thousand pounds. Through exhaustion and half delirium he labored on; no man should be wronged through him, still less by him; at last, with task almost done, strength failing, memory failing, intellect failing, he still struggled on; seeking in a milder climate, for a little while, a remedy for a broken and ruined constitution; seeking vainly and carelessly, then coming home to die. Hang high his triumphal flags and funeral wreaths,—a martyr to Honor.

Byron, I'm afraid, would be considered a much less desirable acquaintance; yet I doubt not that there would be considerable stirring of sleepy minds and much pricking up of inattentive ears at the mention of his name; and I dare say that one dime novel carries more pollution to the young minds than the whole story of Byron's life. How much of sympathy has been expended on him, and been most pitifully wasted; and on the other hand, how much holy horror, and holding up of unspotted hands at poems, which, like the Father of Evil, are not half as black as they are painted. It is a pity that so much interest and curiosity should have been excited, when he sneered at the one and misled the other, while he loved them both. Book-stores teem with "The Letters of Byron," "The Life of Byron," "Conversations with Byron," and "Recollections of Byron." All who were brought into contact with him, who ever caught a remark from his lips, or received a letter from his hand, have contributed what they could to enrich our knowledge of him; the heroes of some of his poems are confessedly portraits of himself; yet with all this store, we linger, hesitate, doubt, and wonder if the real Byron was like the Byron we have painted to ourselves. Alas! for poor human nature, a little wickedness is so spicy!

If Thomas Moore had continued in the errors of his youthful ways, been a sneering idler, broken hearts and vows, and fallen on a foreign battle ground, driven there by pure weariness and lack of occupation, and a kind of fine vanity, he too might have had his poems devoured, his portraits treasured up, and his

manners copied by all the weak heads and perhaps all the wise ones, in Great Britain.

After Byron's race was run, and the sun of Moore's life was dipping in the horizon, a little coterie of three — Coleridge, Wordsworth, and Lamb — carried off the honors of English book-making. It must have been delightful company! If we but could have been little mice in the wall, when that cultivated and merry set were together! If we could have heard noble, dreamy Coleridge converse,— converse as he never could write; chatted with patient, self-conceited Wordsworth; and rejoiced in the merry quips that came stammering from the lips of dear Charles Lamb. The delightful essayist rises up before us! he wears his customary suit of black, a little rusty with wear; the glance of his bright eye answers the ready smile on his lips; he is so merry, so gay, so light-hearted; his fun beams in a steady blaze of humor, and flashes into gleams of sparkling wit; surely he must have lived his life with sunbeams, and been rocked on a cradle of rose-leaves. If we could but see behind the curtain which hangs between us and the home-lives of our pupils, we would no doubt find many a heart which could take to itself and find comfort from the life of this, the gayest, the saddest, the most pathetic of all our author friends. One must look below the surface of Elia, before he would dream that Charles Lamb was born in poverty, and drudges at the clerk's desk day after day; that for his loving heart there must be no wife nor children; no happy, quiet home; that his life is sacrificed to an insane sister, for whom he must watch and tremble constantly; that he has himself been the inmate of an insane asylum; that the shadow of a terrible family tragedy hangs over him, for the hand of that dear sister whom he guards, and loves, and cherishes, was raised in a moment of madness, and is red with her mother's blood! but he keeps the shadows back, and careless eyes never see them.

The others of the trio have suffered also; our scholars would hardly forget that Coleridge was possessed with the madness of opium eating; and that the exorcised pain took vengeance by returning again and again with redoubled force. The Anabasis in the original, would be about as comprehensible to them as The Excursion; yet even the least critical could be made to see

the almost idiocy of some of the ballads; and when the whole story of his efforts was told, would easily believe that he must have suffered, with his conscious genius, to be laughed at, scoffed at, and condemned; not once or a dozen times, but for forty long years, until his own patience surprised himself, and his conceit surprised every one else.

They have been plodding through that wearisome grammar for years; arithmetic, even for those who love it, is often a tiresome task, and United States history has lost its freshness; would it not be a good plan to take an hour once a week from some one of these branches, and devote it to literature? Make them feel that there is something more worthy in life than flirting, or shooting ducks, or going to parties and theatres; and bring them at last, perhaps, to emulate those who have "left footprints in the sands of Time;" left them high on the shore, where the tides of Envy and Oblivion cannot come, however eagerly they may lap the beach. C. G. D.

[*For the California Teacher.*]

THE BRAIN.

The brain, whether regarded as to its structure or its functions, is a peculiarly interesting organ. It is one of the great centres of the nervous system, and might very properly be termed the workshop of the mind. As the stomach is called the organ of digestion, and the lungs the organs of respiration, so the brain is termed the organ of intelligence. Whether the mind be regarded as a single entity distinct from the body, or as simply the result of changes in the cerebral nervous substance, the brain is the part of the organism through which it acts. In the brain are all the mental processes conducted, and through it all manifestations of intelligence take place. The brain is the receptacle of sensations, the laboratory of thought, the source of volitions, the storehouse of memory, and the seat of consciousness and perception.

The average weight of the male brain is about 50 oz., that of

the female brain about 44 oz. In males the weight ranges from 42 to 60 oz., and in females from 39 to 47 oz. In exceptional cases, like Cuvier's and others, the weight has reached 65 oz. The mean difference between the male and the female brain is about 5 oz. In idiots the brain is very small. In them it has been found to weigh from about 25 to as low as ten oz., the latter weight occurring in a woman forty-two years of age. The smallest brain on record was found in an idiot boy of twelve years of age, its weight being only 8½ oz. The brain bears a general proportion to the weight of the body, and in a perfectly healthy state the ratio is about 1 to 41. This fact probably explains the difference in weight between the male and the female brain; for in 81 males it was found that the proportion of the weight of the brain to the weight of the body was as 1 to 36.50, and in 82 females the ratio was almost the same, viz: as 1 to 36.45. The weight of the brain varies in the different races, and the variation seems to be in harmony with the stature and weight of the body. It is assumed that the cubical capacity of the cranium is a pretty fair indication of the size of the brain. Now, on trial, it is found that the skull of the Caucasian measures, on an average, about 86 cubic inches; in the able bodied negro, about 70 cubic inches; and in the smaller Bush tribes, about 60 cubic inches. It is also found that in the Hindoos, a race of diminutive stature, but very fine organization, the cubical capacity of the cranium is as low as 77 cubic inches.

The only animals in which the brain is absolutely larger than in man are the whale and the elephant; in the former it weighs about 5 lbs., and in the latter from 8 to 10 lbs. The brain of the elephant is larger than that of any animal that is known.

The brain grows rapidly up to the 7th year, and at the 8th year has reached nearly its full size; after the 8th year, however, there is a slight increase up to the 20th year, and a very slow increase even up to the 40th year; from the 40th to the 50th year it is stationary; after the 50th year there is a slow diminution in weight, at the rate, it is said, of nearly an ounce for every decade.

The brain is furnished with a very large supply of blood in proportion to its size; for while it is only about one-fortieth of the weight of the body, it receives nearly one-fifth of the whole weight of the blood. J. B.

Alameda, July 19th, 1873.

[*For the California Teacher.*]

PROGRAMME FOR TEACHING THE COURSE OF STUDIES.

Want of space compelled us last month to only mention briefly the recitations which are to be given from 11 to 12 A. M., and 1 to 4 P. M.; therefore, before entering upon the assignment of the times for study, a few additional remarks may be necessary regarding the conducting of some of the recitations.

As an error crept into the paragraph assigning the recitations from 11 to 12, we here restate said paragraph as it should have read:

From 11 to 12, first, object lessons for the lowest two divisions of the third grade, which, after recitation, are dismissed; then on Monday and Wednesday, geography for the four divisions of the first and second grades; on Tuesday and Thursday, history for the two divisions of the first grade, and geography for the first and second divisions of the third grade.

The following scheme will show the different recitations from 11 to 12 A. M.:

MONDAY AND WEDNESDAY.	TUESDAY AND THURSDAY.
Eighth Class, Object Lessons;	Eighth Class, Object Lessons;
Seventh Class, " "	Seventh Class, " "
Fourth Class, Geography;	Fifth Class, Geography;
Third Class, "	Fourth Class, "
Second Class, "	First Class, History;
First Class, "	Second Class, History.

From 1 to 2.40 P. M., recitations for the whole school in reading and spelling. That is to say, the seventh and eighth classes (the third and fourth divisions of the third grade) must recite every day in reading and spelling; the other classes read, say, on Monday and Wednesday, and spell on Tuesday and Thursday.

Spelling must be oral and written. The oral spelling may be advantageously connected with each reading lesson, if time permits; otherwise, if no other time can be found, a part of every Friday must be set apart for this exercise. In written spelling at least twenty-five words should be dictated to each class. The most expeditious method of conducting a recitation in written spelling, is the following: every class takes up its slates; when every pupil is ready, dictate a word to each class in succession, until twenty-five words, or the number selected, have

been dictated to each class. This will take about ten minutes. Then let the pupils of each class interchange slates for mutual examination and correction, the use of the books from which the words were selected being allowed for this. For this, fifteen to twenty minutes are required; the upper classes will need less time, and may then be detailed to overlook the work of the lower classes. While the pupils are examining each other's slates, the teacher may either pass from pupil to pupil and examine the slates to see how the pupils do their work—which will be frequently necessary—or he may hear some other recitations. In fact, even if he does the former, he will have time in which to hear one or two recitations. But in dictating whole sentences or paragraphs, which should be a frequent exercise, the time will be fully occupied without any other recitations; and therefore none others have been assigned for the hour and forty minutes, from 1 to 2.40, though if it should be necessary, as it may be in some schools, some of the recitations which are set for after 3 P. M., may be introduced from 1 to 2.40 P. M., in which case the exercise in written spelling must be confined to the dictation of a number of words, the dictation of paragraphs being deferred to Friday. After the slates are examined by the pupils, they are repassed to their owners, the mistakes numbered, and credits given accordingly.

If written spelling is conducted in the above manner, word-analysis and defining need not occupy any separate time. For each class will have time enough not only to write the word dictated, but also to analyze and define it.

We remind teachers once more that our remarks in regard to the programme are only *suggestive*. It is impossible to devise a programme adapted to the wants of every schoolroom. The administrative ability of the teacher—one of the first factors of success to the country teacher—will be shown by his ability to frame a programme. Without a good programme, the best teacher will fail, work he never so hard and faithfully. The full course of studies *must* be taught; and to help some of our teachers who may not be able te frame a programme embodying the full course—and there are many such; nay, there are teachers who have no programme at all, nor ever saw the ne-

cessity for one—we give these suggestions. Whoever can frame a better programme, is free to do so.

We do not hold it necessary to give any additional instructions in regard to the recitations which have been assigned from 3 to 4 P. M., except to note an error which crept into the seventh line from the bottom, page 77, where *first* should be substituted for *third*, making said seventh line read "and the first divisions of the second and first grades." It must be remembered that only from the first division of the second grade upwards, grammar forms a study separate from composition.

In the morning, say at ten A. M., and in the afternoon, say at 2 P. M., the whole school should go through some calisthenic exercises. The drilling and teaching of the movements must be left for Friday. Morals and manners form subjects less of set instruction than of constant practice and inculcating during every school hour. Should any definite instruction and recitation be necessary, time must be found for these on Friday. With music it is the same; though singing forms one of the best opening exercises, yet in very few schools can, on any other day than Friday, be instruction given in it. On Friday, however, at least one hour should be devoted to the *teaching* of music.

It is plain from the above, that Friday is reserved for those odds and ends of instruction, reviewing and examining for which no time can be found on the other days of the week.

[*For the California Teacher.*]

TEACHING SPELLING.

Spelling isolated words, as they are usually arranged and grouped in spelling books, is a mere waste of time, utterly useless. It has a tendency to accustom pupils to use words, or read words, without associating a meaning with them; for isolated words awaken and produce no ideas; and because they do not, pupils have no use for them, are not interested in them. Being mere empty, meaningless signs, they are speedily eliminated, rejected and forgotten. Spelling should be, therefore,

taught in connection with every lesson in reading, history, geography, etc. In pursuing this consistent course, we accustom pupils to take notice of the orthography of words at all times, and not at stated spelling lessons only, assigned for that purpose. Constant attention should be paid to the analysis of derivative words. It should be shown that such words contain two elements: the radical, conveying the fundamental idea, and the formative, consisting of prefixes and suffixes, indicating restriction, application and relation. Explain and exemplify what is meant by the primary, literal, and figurative meaning of words.

In spelling, written exercises are of more value than oral exercises, and yet the former should never supplant the latter. At the close of every reading lesson, the words tabulated at the head of the lesson, together with the new or difficult words occurring in the body of the lesson, must be spelt orally. Also words in common use, including the new words occurring in object lessons, geography, arithmetic, grammar, etc., must be spelled orally, either at the close of the various recitations, or at some time specially set apart for oral spelling. As a second exercise, all the spelling lessons must be neatly written by the pupils on their slates and on the blackboard; and the more difficult words should be written in columns on the blackboard, and frequently read and reviewed. In all written exercises, the spelling should be carefully scrutinized, and the misspelled words given to the pupil or the class at the next exercise; and it is better that the misspelled word be re-written correctly, and in such a position that the false and true spelling may be seen at a glance.

The writing, at dictation, of whole paragraphs is another useful and indispensable exercise. To teach the use and spelling of words, the teacher should construct sentences unlike those found in the book.

It must be remembered that the minimum requirement in this study is the ability to spell orally, or write at dictation any word or paragraph of the reading lessons, and the technical words used in the several branches taught.

No special instruction for the several divisions is needed. We append a few general directions.

I. Spelling by sound should begin with such words as contain only the simplest elemental sounds, and then be extended to all words learned. Each sound of the word spelled should be given with promptness and decision. Distinct articulation; no sliding together of the sounds; each sound must be clearly and sharply defined. Teachers should know and carefully observe the position of the organs in the utterance of each sound; defective utterances must immediately be cured. Valuable suggestions will be found in *Murdock & Russell's Vocal Culture.*

II. Pronounce the words as if reading them aloud. Avoid the use of any unnatural tone of voice.

III. Never depart from the ordinary pronunciation for the sake of indicating the orthography.

IV. In oral exercises, pupils should pronounce each word distinctly before spelling it.

V. In oral spelling, special attention must be given to syllabication: pupils should syllabicate in all cases. Frequently the sound of the syllable is not the same as the sound of the name of the letter; syllabication is also an efficient help to distinct and correct articulation in reading.

[*From the Ohio Educational Monthly.*]

METHODS OF CONDUCTING RECITATIONS.

We have long been satisfied that the success of teachers, as a class, would be much increased by a careful study of the subject of class management. There are many teachers who can give no good or satisfactory reason for using one method of conducting recitations rather than another. The truth of this remark has been fully attested whenever teachers have been called upon by examiners to state in writing the comparative merits of different methods. "These things being so," it occurs that a systematic presentation of the principal advantages and disadvantages of the consecutive and promiscuous methods of calling on pupils to recite, may be of assistance to some of our readers.

I. THE CONSECUTIVE METHOD.—The first advantage of the consecutive or "turn" method is its *rapidity*. As the pupils recite in turn, no time is lost in designating the pupil who is to recite, and as each pupil knows just when he is to be called on, he is prepared to recite promptly. It is true that when the promiscuous method is skillfully used, each pupil is obliged to be ready to respond, but the possibility that he may not be called on, causes, as a rule, some hesitation. In the turn method the pupil's reciting is a *certainty*, and hence he is not only upon the alert, but is ready to proceed. Experiment shows conclusively that more questions can be asked and answered in a given time when the consecutive method is used than when pupils are called on promiscuously.

The consecutive method is *easy for the teacher*. It relieves him from the necessity of selecting and designating the pupils to recite, and hence his labor (not including the imparting of instruction) is reduced to asking questions, or assigning topics, and the determining of the correctness of the reciting of the pupils. The recitation proceeds as mechanically as clock-work.

A third advantage of the consecutive method is the fact that *all the pupils have an opportunity of reciting*. No pupil is omitted. If the class is too large to permit all to recite at any recitation, the next day takes up the work at the proper pupil, and thus all are called on in due time, and all have an equal opportunity of reciting. This last remark may not be true, if the members of the class do not take their places from day to day in a fixed or regular order. The importance of this advantage will be considered in connection with the promiscuous method.

The chief disadvantage of the consecutive method is *its failure to necessitate close and universal attention*. The pupil reciting and the one who has the next "turn" must give attention, but the others are not obliged to do so. When the pupils near the head of the class are reciting, those near the foot may be thinking of the next holiday. As soon as a pupil has recited, he can go a-fishing mentally until his "turn" comes again. A skillful teacher may, of course, so interest his class in the lesson as to secure close and undivided attention, but this is not a result of the consecutive method. The attention is secured not in consequence of but in spite of it.

A second disadvantage of the turn method is the fact that *it permits a partial preparation of the lesson.* The pupil near the foot of the class is tempted to neglect the part of the lesson which will be recited by the pupils near the head, and *vice versa.* When the old plan of having the pupils read one "verse" each, prevailed, many pupils counted the verses, and studied only the one which they would read. As a general rule, pupils will study most faithfully that portion of the lesson which they expect to recite, and the turn method permits this expectation. This defect may be obviated by assigning questions and topics in a different order from that in the text-book, and much more easily by having the recitation *begin* from day to day at different places in the class. If the third pupil *begins* the recitation one day, the tenth the next day, the sixth the next day, and so on, no pupil, when preparing the lesson, can even guess what portion of it will fall to him to recite, and hence he is only safe when he has prepared the whole lesson. Many teachers who use the consecutive method have never thought of this simple means of correcting the obvious and often serious defect above referred to.

Another disadvantage of the consecutive method is the fact that *it prevents the most thorough testing of the pupil's preparation.* The portion of the lesson which falls to a pupil by turn, may be the very portion which will be least profitable for him to recite. He may be able to recite this well, and yet the teacher may know that he has not faithfully studied or does not clearly understand another portion. The revolving recitation may bring to the idle pupil the only question or topic in the lesson which he can recite, and he may thus be tempted to trust to good (?) luck next time. The highest efficiency of a recitation requires that its tests be skillfully and wisely distributed.

II. THE PROMISCUOUS METHOD.—The promiscuous method of calling on pupils to recite *secures and holds the attention of all the pupils in the class.* This result depends somewhat on the skill of the teacher, but the method both permits and favors the highest success. When a topic or question is announced, every pupil is obliged to be on the alert, as he may be designated to recite. He must also give attention to the pupil reciting, as, at any moment, he may be called upon to correct errors, supply

omissions, or complete the recitation. The degree of attention given to pupils reciting may be greatly increased by the teacher's frequently calling on a pupil to complete the recitation of another, taking it up at precisely the right point. This may be done with great success in recitations in arithmetic, particularly in the oral solutions of mental problems; also in history, reading, and indeed in nearly all the branches. This advantage of the promiscuous method is wholly lost when the pupil to recite is designated before the topic is assigned. The reason is obvious. The teacher should not even glance at the pupil to be called upon before assigning the topic.

A second advantage of this method is the fact that *it necessitates the preparation of the entire lesson.* No pupil knows what part of the lesson will fall to him; nor can he tell even after the recitation is begun. He is liable to be called upon to recite any part of the lesson, and his only safety is to make full preparation.

The promiscuous method also permits *a proper distribution of the recitation.* The tests can be thrown by the teacher just where they will prove most effective and do the most good. The idle pupil may be given full opportunity to show the results of idleness; the pupil who was assisted yesterday may be called upon to recite in review; any want of attention may be instantly corrected, etc., etc. The recitation may be made a thorough test.

As a result of the foregoing advantages, the promiscuous method makes the recitation *a fine mental drill*—an excellent mental gymnastic. The difference between it and the consecutive method may be easily shown. Suppose a class in arithmetic, containing twenty pupils, solves twenty mental problems in a recitation. By the consecutive method, as generally used, each pupil solves one problem and he is obliged to solve but one. Hence the recitation necessitates but twenty solutions. By the promiscuous method each pupil is obliged to solve mentally each of the twenty problems, and hence the recitation necessitates four hundred mental solutions.

The principal disadvantages of the promiscuous method are as follows:

1. *It is less rapid* than the consecutive method, time being necessarily consumed in designating the pupil to recite.

2. *It is not so easy for the teacher* as the consecutive method. The increased attention and interest secured by it may, however, be more than an offset to the extra labor involved in selecting the pupils to recite.

3. It does not give the pupils *an equal opportunity of reciting.* This defect is most serious in large classes, the teacher being liable to omit some of the pupils. We have known classes in which it often happened that certain pupils did not have an opportunity to recite for several successive recitations. This almost invariably results in a loss of interest on the part of the omitted pupils, and a neglect of study. Few pupils will thoroughly prepare lessons, if there is even a strong probability that they will not be called on to recite. Faithful study is most certainly secured when every recitation tests the preparation of each pupil in the class. Pupils are sometimes omitted purposely, this being most likely to occur in certain schools when visitors are present, as in public examinations. The temptation to call on the brightest and best pupils on such occasions, is too strong for many weak teachers to resist.

4. It permits *an improper distribution of the recitation.* This disadvantage is similar to the third, but it merits separate consideration. Easy and superficial teachers are apt not only to assign the greater portion of the recitation to the brighter pupils, but to *assort* their pupils according to the nature of the topics or questions. The difficult questions are assigned, it may be unconsciously, to the best pupils, and the easy tests are given to the dull and backward. A "severely thorough" teacher, on the contrary, is liable to fall into the habit of overwhelming the backward or mentally feeble pupils with all the difficulties of each lesson and most of the reciting.

Various devices have been resorted to by teachers to obviate the last two defects of the promiscuous method. One of these is to put the name or number of each member of the class on a small card. The cards are mixed thoroughly at each recitation, and the pupil to recite is selected by the card drawn or picked up by the teacher. This plan works very well in advanced classes with long recitations, and especially if the teacher frequently takes a card from those already drawn, thus holding the attention of those who have recited.

Another device is to put all the numbers of the members of the class on one card, arranging the same in the form of some geometrical figure which will permit the calling of the numbers on successive days in different orders. We have used this plan, which, we believe, we devised, with great satisfaction. It leaves the teacher free to sit or stand during the recitation, to move about the room and occupy different positions. When the recitation closes, the teacher knows what pupils, if any, have been omitted, and by frequently calling on pupils without reference to the card, the attention of the entire class is held.

But the easiest plan of avoiding the defects of the consecutive and promiscuous methods is *to combine them, by permitting pupils to recite by turn* EXCEPT *when the teacher designates another pupil.* If these exceptions are sufficiently numerous, the attention of the class will be as universally held as by the promiscuous method. The most skillful teacher of oral spelling we have ever known combined these methods. The words passed rapidly down her class except when she "threw" them to other pupils, which was done so frequently and skillfully that no pupil felt safe in taking his eye from her. When the recitation closed, every pupil had been tested, and the poor spellers, and careless had received special attention. A little practice will enable any skillful teacher to combine these methods successfully.

[*From the Evening Mail.*]

THE GOVERNMENT OF THE EYE.

The influence of the eye in the government of children has not been sufficiently noted, but any one can convince himself of its power by experiment and observation. Not an angry look at all, but a steady one—an almost magnetic gaze—is the expression required. This gives the impression of superior will or talent force held in reserve, which arrests the attention, and ultimately insures the submission of the most rebellious. The animals control their young by the eye and the voice combined; no violence is used, no reasoning (that we are aware of) attempted, yet perfect obedience is exacted and rendered. A

calf or a lamb, a few days old, on being for the first time placed by its mother in a fence corner, among the bushes, and left hidden there while she grazes, will soon leave its shelter and come out, either to seek its mother or to play; but the watchful parent goes at once, without delay of an instant, and leads the little one back again, and yet again, until it learns to obey. Each time that she makes it lie down she stands looking at it awhile. Then presently, when it has remained quiet long enough, she, standing at a short distance in the field, will call gently, and the little creature immediately leaps and runs to her side. A hen will separate two of her chickens who are fighting, and lowering her head look at the aggressor steadily until he is subdued and peaceable. It is also very interesting to watch a cat training her playful family, who give her but little trouble until they get their eyes open. Then all wish to come sprawling and tumbling out of their basket, and as their mother has hunting to do, she must train them to remain quiet during her frequent absence. So, after breakfast, she makes their toilet, puts each one in its proper place, and goes a little way off, pretending not to look toward them. By and by a kitten or two becomes restless and begins to crawl out of the nest; but the mother returns at once, replaces and surveys her children calmly and with patience, and again retires, often to a greater distance than before, to return again on the first manifestation of disobedience. One morning spent in teaching her babies generally suffices for puss, who after that can go hunting when she will, sure of finding her children all at home and quiet on her return. Now, if we are really wiser than the animals, should we not show proof of it by our mode of governing young children? It is true that the nervous activity and strong will which most American babies inherit, make them less docile than young animals; but this can be met by greater patience and self-control on the part of parents. The success of the few who have faithfully tried to do their whole duty by their children is so great that every mother may be encouraged to make the attempt. What a nation we shall become when every child is properly trained!

DEPARTMENT OF PUBLIC INSTRUCTION.

The actual and comparative condition and progress of the Public Schools of California, for the two years commencing July 1st, 1871, and ending June 30th, 1873, may be summarized as follows:

CENSUS STATISTICS.

	1872.	1873.
Number of White children between the ages of 5 and 15 years.....	135,198	139,596
Number of Negro children between the ages of 5 and 15 years.....	874	944
Number of Indian children between the ages of 5 and 15 years.....	1,279	1,070
Total number of census children between the ages of 5 and 15 years,	137,351	141,610
Total number of census children in 1871.....		130,116
Increase.....		11,494
Number of White children who have attended public schools at any time during the school year.....	92,255	97,018
Number of Negro children who have attended public schools at any time during the school year.....	385	458
Number of Indian children who have attended public schools at any time during the school year.....	144	205
Total number of census children who have attended public schools at any time during the school year	92,784	97,681
Total number in 1871		83,628
Increase.....		14,053
Average number of census children belonging to public schools.....	72,972	78,395
Average daily attendance of census children.....	65,700	69,461
Percentage of total number enrolled.....	67.55	68.96
Percentage of average number belonging	53.13	55.35
Percentage of daily attendance	47.83	49.05

SCHOOL FACILITIES OF CENSUS CHILDREN FOR 1873.

	Total Number Enrolled.	Average Number Belonging.	Average Daily Attend'ce.
In schools maintained 10 months or more.....	46,309	37,970	33,649
" " 9 "	7,598	6,517	5,776
" " 8 "	18,121	14,298	12,671
" " 7 "	7,390	5,625	4,984
" " 6 "	5,499	4,289	3,800
" " 5 "	4,942	3,954	3,504
" " 4 "	2,619	2,113	1,872
" " 3 "	2,840	2,449	2,170
" " less than 3 months.....	2,363	1,180	1,045

RECAPITULATION.

In schools maintained 8 months or more	72,028	58,785	52,096
" " less than 8 months	25,653	20,610	17,365
Percentage of census children in schools maintained eight months or over	50.86	41.51	36.78
Percentage of census children in schools maintained less than eight months	18.10	13.84	12.27

	1872.	1873.
Total number of census children who have attended only private schools at any time during the school year	13,787	12,507
Total number in 1871		15,524
Decrease		3,017
Total number of census children who have attended no schools during the school year	30,780	31,422
Total number in 1871		30,964
Increase		458
Percentage of census children enrolled in public schools	67.55	68.96
" " " enrolled in private schools	10.04	8.84
" " " attending no schools	22.41	22.20

But in order to obtain a correct estimate of the attendance at school of census children, we must take the average number *belonging*, that is the number of children who can be considered as *actual pupils* of the public schools, instead of the total number enrolled, as in this number are included all those who attend for so short a time—sometimes only for a day, or at longest for a week—that they cannot be classed as *pupils* of the public schools. The whole attendance will then stand:

	1872.	1873.
Number of census children attending public schools	72,972	78,395
" " " " private schools	13,787	12,507
" " " " no schools	50,592	50,708
Percentage of census children attending public schools	53.13	55.36
" " " " " private schools	10.04	8.84
" " " " " no schools	36.83	35.80

SCHOOL STATISTICS.

	1872.	1873.
Total number of school districts	1,395	1,462
Total number in 1871		1,326
Increase		136

Number of districts maintaining a 10 months' school	135
" " " " 9 "	100
" " " " 8 "	402
" " " " 7 "	188
" " " " 6 "	173
" " " " 5 "	153
" " " " 4 "	97
" " " " 3 "	142
" " " " schools less than three months	72

RECAPITULATION.

Number of districts maintaining schools 8 months or over		637
Number of districts maintaining schools less than eight months		825
Number of first grade schools	318	465
" second "	643	761
" third "	693	642
Total number of schools	1,654	1,868
Total number of schools in 1871		1,550
Increase		318
Whole number of boys enrolled on register	49,764	56,247
" " girls " "	44,956	51,346
Total number enrolled	94,720	107,593
Total number enrolled in 1871		91,232
Increase		16,261
Number enrolled between the ages of 5 and 15 years	92,720	97,681
Number enrolled over 15 years of age	1,936	9,912
Average number belonging	72,972	78,395
Average number belonging in 1871		72,031
Increase		6,364
Average daily attendance	65,700	69,461
Average daily attendance in 1871		64,286
Increase		5,175

	1872.	1873.
Percentage of average number belonging	77.04	72.86
Percentage of average daily attendance on total number enrolled	69.36	64.56
Percentage of average daily attendance on average number belonging	90.03	88.60

Number of male teachers	881	882
Number of female teachers	1 420	1,454
Total number of teachers	2,301	2,336
Total number of teachers in 1871		2,052
Increase		284
Average number of months schools were maintained, for all the schools of the State		6.14
Average number of months schools were maintained, for all the schools of the State in 1871		6.15
Decrease		0.01

	1872.	1873.
Number of schools for colored children	24	22
Number of schools for colored children in 1871		20
Increase		2
Number of pupils attending schools for colored children	537	414
Number of pupils attending schools for colored children in 1871		510
Decrease		96

FINANCIAL STATISTICS.

(*a*) RECEIPTS.

	1872.	1873.
Received from State apportionments	$424,021 85	$430,219 60
Received from State apportionments in 1871		423,550 89
Increase		6,668 71
Received from County apportionments	988,636 21	1,179,072 45
Received from County apportionments in 1871		889,622 86
Increase		289,449 59
Received from district taxes	261,306 90	362,525 05
Received from district taxes in 1871		144,265 93
Increase		218,259 12
Received from rate bills, subscriptions and miscellaneous sources	232,075 22	310,502 30
Received from rate bills, subscriptions and miscellaneous sources in 1871		212,151 60
Increase		98,350 70

Total receipts (including balance on hand at beginning of the school year)	2,131,783 58	2,551,779 07
Total receipts (including balance on hand at beginning of the school year) in 1871		1,884,586 84
Increase		667,192 23

	1872.	1873.
Percentage of school funds from State apportionments	19.89	12.94
Percentage of school funds from State apportion'ts in 1871		22.47
Decrease		9.53
Percentage of School funds from County apportionments	46.38	46.26
Percentage of School funds from County apportionments, in 1871		47.21
Decrease		.95
Percentage of School funds from other sources	33.73	40.80
Percentage of School funds from other sources in 1871		30.32
Increase		10.48
Amount of State apportionment per census child	$3.30	$3.18
Amount of State apportionment per census child in 1871		3.56
Decrease		.38
Amount of County apportionments per census child	7.60	8.58
Amount of County apportionments per census child in 1871		7.31
Increase		1.27
Amount from other sources per census child	5.53	6.86
Amount from other sources per census child in 1871		4.69
Increase		2.17

(*b*) EXPENDITURES.

	1872.	1873.
Paid for teachers' salaries	$1,282,799 15	$1,434,366 93
Paid for rent, repairs, fuel and contingent expenses	277,900 99	275,674 71
Paid for school libraries	25,793 54	24,879 48
Paid for school apparatus	4,720 13	4,365 70
Total current expenses	1,591,213 81	1,739,286 82
Total current expenses in 1871		1,311,050 08
Increase		428,236 74
Paid for sites, buildings, and school furniture	290,119 01	374,069 44
Paid for sites, buildings, and school furniture in 1871		390,158 50
Decrease		16,089 06

Total Expenditures	1,881,332 82	2,113,356 25
Total Expenditures in 1871		1,701,208 58
Increase		412,147 67

Average amount needed for a 10 months' school, for every teacher employed,	$1,087 22
" " " 9 " " " " "	758 84
" " " 8 " " " " "	699 00
" " " 7 " " " " "	549 33
" " " 6 " " " " "	439 06
" " " 5 " " " " "	394 53
" " " 4 " " " " "	318 93
" " " 3 " " " " "	230 48

	1872.	1873.
Average monthly wages paid to male teachers	$80 82	$84 28
Average monthly wages paid to male teachers in 1871		74 58
Increase		9 70
Average monthly wages paid to female teachers	66 33	63 37
Average monthly wages paid to female teachers in 1871		60 69
Increase		2 68

SCHOOL PROPERTY.

	1873.	1873.
Valuation of lots, school houses and furniture	$3,685,912 58	$3,896,553 25
Valuation of school libraries	108,098 88	124,256 81
Valuation of school apparatus	28,651 69	36,605 39
Total valuation of school property	3,822,663 15	4,057,415 45
Total valuation of school property in 1871		3,362,580 18
Increase		694,835 27

REPORT OF THE STATE NORMAL SCHOOL.

On the first day of August there were in attendance upon the Normal School, aside from the Training School, one hundred and eighteen pupils. Of these, forty-one were regular pupils in the senior class, and six irregular attendants in the class; sixty-seven had been regularly admitted to the junior class, and four admitted on trial. During the month four seniors left, all to begin their schools, and one irregular and two regular pupils were admitted to the senior class. Seven juniors left, three to begin their schools, and four for other causes. Seven applied for admission to the junior class, of whom five were admitted on trial, and two advised to go to other schools until more thoroughly prepared; making for the month the following

SUMMARY.

Whole number in attendance August 1st	118
Number left	11
Number of pupils remaining	107
Number admitted	8
Attendance, September 1st	115
In the Training School the attendance for the month is	40

As will be seen elsewhere, the Board of Trustees have ordered an addition to the Training School of two classes of forty each. These classes will be organized and in operation some time in September, and the senior class will then begin their practice teaching, for which they are now preparing. In addition to the studies prescribed for the senior year, the seniors are studying "Methods of Teaching," devoting one exercise each day to purely professional preparation.

A WORD OF PRAISE.—The successful encouragement of the best traits in children is acknowledged by all to be an exceedingly difficult task, yet a judicious word of praise now and then, often renders it easier, for continual severity is often quite as hurtful in its effect as unwise indulgence. Some parents are so afraid that a child will grow vain that they never praise him, and this course is often disastrous. It is apt to produce either too much self-assertion—for self-assertion is a legitimate outgrowth of the withholding of commendation to which one is entitled—or to engender a self-distrust or melancholy hopelessness of disposition. Praise is sunshine to a child, and there is no child that does not need it. It is the high reward of one's struggle to do right. Thomas Hughes says that you can never get a man's best out of him without praise. Many a sensitive child, we believe, dies of a hunger for kind commendation. Many a child starving for the praise that a parent should give, runs off eagerly after the designing flattery of others. To withhold praise where it is due is not honest, and in the case of a child, such a course often leaves a stinging sense of injustice. Motives of common justice, as well as a regard for the future of the child, should influence the parent to give generous praise for all that deserves it. Of course there is a difference in the constitution of children. Some cannot bear so much praise as others, and some need a great deal. A knowledge of their different dispositions will help to decide the just portions of praise which may safely be accorded to each.

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CALIFORNIA TEACHER.

NOVEMBER, 1873.

VOL. XI. SACRAMENTO. No. 5.

COMPULSORY EDUCATION.

[We publish, by permission, this and the following article from advance sheets of the forthcoming Biennial Report of the Superintendent of Public Instruction. The vital importance of the questions treated of, warrants us in making place for them to the exclusion of our usual reading matter.—EDS. CAL. TEACHER.]

In the preceding summaries [published in the last number of the TEACHER] I have endeavored to exhibit the condition and progress of the public schools of the State. I have given special attention to the collecting and collating of the data which are necessary to the consideration of two questions which pre-eminently claim the serious attention of the people and legislature of California. The first, called by some the most important school question of modern times, may be stated as follows: How shall we arrest the evils of non-attendance and truancy, and secure to every child of the State the rights and benefits of education? The second question relates to the ways and means of providing for every district of the State sufficient and equal educational facilities.

The following statistics will show the attendance at public and private schools, and the non-attendance and truancy, of census children, for a period of eight years. It would be misleading to include in this table the statistics previous to 1866, as up to that year children between four and eighteen years of age were listed on the school census, and since then only children between five and fifteen years of age.

Year.	Listed on Census.	Enrolled in Public Schools.	Percentage Enrolled.	Enrolled in Private Sch'ls.	Percentage.	Attended no School.	Percentage.
1866	85,152	37,906	44.51	25,475	29.92	21,771	25.57
1867	94,349	54,726	58.00	18,182	19.38	21,441	22.62
1868	102,183	60,946	59.64	17,654	17.28	23,583	23.08
1869	110,642	67,834	61.31	17,344	15.68	25,464	23.01
1870	121,751	70,030	57.44	24,654	20.33	27,067	22.23
1871	130,116	83,628	64.27	17,029	13.50	29,459	22.64
1872	137,351	92,255	67.55	13,787	10.04	30,780	22.41
1873	141,610	97,018	68.96	12,507	8.84	31,422	22.19

Year.	Listed on Census.	Average Number belonging to Public Schools.	Percentage.	Percentage of Truancy on number of Census Children.	Percentage of Non attendance and Truancy combined.
1866	85,152	28,232	33.15	11.36	36.93
1867	94,349	41,411	43.89	14.11	36.73
1868	102,183	45,667	44.69	14.95	38.03
1869	110,642	52,168	47.15	14.16	37.17
1870	121,751	50,155	41.19	16.25	38.48
1871	130,116	65,949	50,68	13.59	36.23
1872	137,351	72,972	53.13	14.42	36.83
1873	141,610	78,395	55.36	13.60	35.80

Two facts are brought prominently to view by the above statistics: the steadily increasing popularity of public schools, and the almost inappreciable abatement of the evils of non-attendance and truancy. In eight short years the attendance at private schools has decreased 21.08 per cent.; 15,294 children, in a total of 141,610, have been transferred from private schools to public schools. No greater tribute can be paid to the popularity of our public school system.

But while we are steadily gaining for our public schools the support of those who were at first opposed or indifferent to them, we have signally failed to impress that large class of people who, through self-interest, carelessness, or ignorance, ignore the claims of their children to the rights and benefits of at least a common school education. To have reduced in eight years the non-attendance only 3.38 per cent., or 4,786 in a total of 141,610, and to find that truancy has increased 2.24 per cent., and now amounts to 19,259 in a total of 141,610, is a very discouraging showing for our State.

It may be claimed that this is a gloomier showing than the facts warrant. There is little ground for such belief if based

upon supposed inaccuracies in taking the census. County Superintendents and Census Marshals were repeatedly instructed to list in the number attending public schools, every child which had attended a public school at any time during the school year, no matter for how short a time, if even only for a day. That the instructions were closely followed, is proven by the number of children which formed the average number belonging to public schools; of 97,018 listed as having attended public schools at any time during the school year, only 78,395 of these have attended long enough and regularly enough to be entitled to be considered as pupils of the public schools. That even among this number a large percentage was irregular in attendance is proven by the fact that the average daily attendance was only 69,461, 88.60 per cent. on the average number belonging, or 49.05 on the total number of census children.

For listing the number in attendance at private schools, the instruction was to exclude all who had at any time during the school year, if only for a day, attended public schools. This instruction was necessary because the custom had been that if a child had attended both public and private schools, it was so listed. This was especially the case in districts in which private schools were maintained at the close of the public schools; and I have many districts on record in which the attendance at private schools nearly or fully equals the attendance at public schools, and both together far exceed the total number of census children. And this has been the case even in the reports for 1873, and instead of a shortage there is most likely an excess in the attendance at private schools. For if in any case the sum of the attendance at public and private schools and the non-attendance, exceeded the total number of census children, the excess was invariably deducted from the non attendance, making the latter less than the real number. This will seem less doubtful if we bear in mind the natural reluctance of parents to acknowledge that their children are attending no school whatever.

However gloomy, then, the educational outlook of California may be, I am convinced that the above statistics present a fairer view than would be warranted by the facts, could they be accurately ascertained. At the same time, I am fully convinced that, now that once the real extent of the growing evils of non-

attendance and truancy has been exhibited, the remedy will be promptly and unshrinkingly applied.

To the question, "What is this remedy?" only one answer can be given, or at least only one answer has thus far been found. Admitted that education forms the only secure foundation and bulwark of a *republican* form of government, if not of every form of government; admitted that the universality of education becomes thus of vital importance to the State; and admitted that the exigencies of the case not only empower but compel the State to provide all the facilities necessary to enable every child to acquire at least a common school education, and we are forced to the conclusion that it is not only the privilege but the duty of the State to compel every parent to bestow upon his children at least the education which the State places within his reach.

THE SUPPORT OF OUR COMMON SCHOOLS.

The second question which claims our attention relates to the ways and means of providing for every district of the State sufficient and equal educational facilities.

In the summaries fronting the report it is shown that of the 1,462 school districts in the State in 1873, only 637 districts, or 43.57 per cent., maintained public schools for eight months or more; and the remainder, 825 districts, or 56.43 per cent., maintained public schools for less than eight months. True, the 637 districts represent 106,208 census children, or 75 per cent. of all the census children in the State; whilst the 825 districts represent only 35,402 children, or 25 per cent. of the census children in the State. Yet this proves only the more clearly, as my predecessor already stated in his last biennial report, that "while in our centres of wealth and population the children have the advantage of a full year's instruction, with the best facilities for learning, truth compels the confession that for the more remote and sparsely settled districts of the State our present system is wholly inadequate, and is but a pretence for popular education. Under the present system many districts can maintain schools only from three to six months of the year. No one need be told that such fragmentary bits of instruction are only a little better than none at all During these short school terms

the pupils of such schools only get fairly started in their studies, to be turned out for the greater part of the year, forgetting what little they had learned, and then coming back after this long and ruinous interval to commence again at the former starting-place, at the foot of the hill of knowledge, under a new teacher—the old one having sought a new place rather than attempt to live on the hope of another three or six months' school next year. This is but a sham, a waste of the public money, and a flagrant injustice towards a portion of the children of the State. There are very many of these schools thus revolving year after year on the axis of a defective system, making some motion, but scarcely any real progress. In a State system of public instruction should not all the children be treated alike? As a good mother, she should dispense the blessings of education with an equal hand."

Our present system of common schools very forcibly illustrates that "whosoever hath, to him shall be given, and he shall have more abundance: but whosoever hath not, from him shall be taken away even that he hath." Yea, it goes further, it determines even when a district is to be thrust from without the pale of our common school system: for should the number of census children fall below a certain figure—20 for some counties, up to as high as 30 for others—our present system does *not* provide funds enough to keep up and support in the district a school for at least three months in every year, the third section of the ninth article of the Constitution of California to the contrary notwithstanding. We have thus over a hundred districts in the State unjustly and unconstitutionally thrust from without the pale of our common school system. And this when in many counties the maximum rate allowed by law is levied for school purposes, and when in every county more than the minimum amount of county school money is raised.

The inadequacy and disabilities of the school revenue law have never pressed more heavily upon our schools than at present. With our number of census children increased nearly 9 per cent. since 1871, the school funds provided by the State have increased only 1.5 per cent. In 1871 the State apportioned $3 56 to each census child, in 1873 only $3 18, a decrease of 38 cents per census child, or $53,811 80, if the State had desired to contribute to the support of the public schools as much

in 1873 as it contributed in 1871. But if we compare the amounts actually raised for the support of our public schools in 1871 and 1873, it will be seen that in 1871 the State contributed 9.53 per cent. more to their support than in 1873. For, of all the money raised for school purposes, in 1871 the State contributed 22.47 per cent.; in 1873 only 12.94 per cent. There is even a falling off of .95 per cent. in the amounts raised from county taxes. And yet the people are so much in earnest in their support of the public schools, that in 1873 they voluntarily taxed themselves 10.48 per cent. more than they did in 1871. The following table will show at a glance how much the State contributes towards the support of our common schools; how much the counties contribute, and how much is left to private liberality.

	1871.	1872.	1873.
Percentage of school funds from State apportionments.....	22.47	19.89	12.94
" " " County "	47.21	46.38	46.26
" " " other sources	30.32	33.73	40.80
Amount of State apportionment per census child.....	3.56	3.30	3.18
" County " " "	7.31	7.60	8.58
Amount from other sources per census child.....	4.69	5.53	6.86

Comment is unnecessary. And if we remember the lavishness, nay prodigality with which the State has endowed and supports the State University, we shall be able to excuse the chagrin, the righteous indignation of all true friends of popular education when speaking of the parsimony with which the State supports our public schools.

The legislature of 1869–70 was the first to attempt to provide for every district having more than twenty-five census children and seventy-five thousand dollars worth of taxable property, sufficient funds to keep up and support an eight months' school. The annual *ad valorem* tax was raised from eight cents to ten cents on each one hundred dollars' value of all taxable property throughout the State. Then the following provisions were added to the law:

SEC. 98. The County Superintendent in each County shall, on or before the first day of March in each year, furnish to the Board of Supervisors and Tax Collector, respectively, an estimate in writing of the cost of maintaining a free school for eight months in each school district in the county, together with the cost of incidental expenses and necessary repairs; and also an estimate of the amount of public money, both State and county, to which each district will be entitled during the year, and the amount necessary to be raised in each school district to support a school eight months.

SEC. 99. The Board of Supervisors in each county shall, after receiving the assessment roll from the County Assessor, and before the first Monday in September of each year, levy a special school tax upon the property in each school district in which there shall be a deficiency, as shown by the written statement of the County Superintendent, for an amount which, together with the State and county money to be received, shall be sufficient to maintain the school (or schools) for eight months during the year; and said tax shall be equalized and collected in the manner provided for equalizing and collecting State and county taxes. The Collector shall pay over the money so collected to the County Treasurer, who shall place it to the credit of the respective districts from which it shall be collected, as a special deposit, and pay it out on the warrant of the County Superintendent in the manner provided for the payment of State and county school money.

SEC. 100. Any school district whose taxable property does not exceed seventy-five thousand dollars, and containing not more than twenty-five children between the ages of five and fifteen years, shall, on a proper showing of the facts, be exempted from the requirement to maintain a free school eight months.

This law remained in most counties a dead letter, on account of its defects in defining with sufficient clearness the duties and the penalties incurred by a neglect of duty, of the several officers required to execute it. The law was always considered inadequate to the accomplishment of its intended purpose. It was found that its rigid execution would entail such an oppressive taxation as to overtax the resources of the very districts designed to be specially benefited by the law. Hence in several counties the Board of Supervisors point-blank refused to levy the special tax. The people acquiesced, and looked to the legislature of 1871–72 for relief. But in vain; at the close of the legislative session it was discovered that instead of additional revenues, the former revenues of the schools were materially curtailed. Instead of a ten cent *ad valorem* tax, only $240,000 were granted for the support of the public schools. Still the legislature had remedied the defects of the special school tax law, above quoted; and though the tax would be a grievous burden to many districts, it was preferable to the alternative of either closing school, or of supporting the schools by voting a tax, the most vexatious and expensive mode of raising school funds. Hence in October, 1872, the Boards of Supervisors throughout the State levied the special tax as required by law. But before the tax could be generally collected, the Supreme Court delivered an opinion declaring unconstitutional any law providing for the collection of a district tax resting upon an assessment not made by an assessor elected by the qualified electors of the district where the property assessed is situated. Of course such a decision decided the unconstitutionality of the special school tax law. The State Board of Equalization imme-

diately issued instructions to the County Assessors throughout the State, directing them to desist from collecting and assessing the special school tax. In accordance with these instructions, no special taxes were levied this year, 1873, and those levied last year, if unpaid, or paid under protest at the time of the delivery of the above referred to decision of the Supreme Court, were remitted. This worked serious hardships last year. For in many counties the Board of Supervisors, unable to shirk the disagreeable duty of levying the special tax, made it as onerous as possible, by reducing the rate of the county school tax, in some instances even below the legal minimum, thereby unnecessarily increasing the amount to be raised by special tax. This year better counsels have prevailed, and an increased rate of tax for county school purposes somewhat compensates for the total loss of the special tax and the ever diminishing amount per census child derived from the State apportionments.

As the school law stands at present our public schools derive their funds, first from State apportionments, the amounts of which per census child are decreasing in proportion to the increase in the number of census children; secondly, from county apportionments, yielding in many counties the largest amounts which the law allows or the people well can bear; third, from special taxes voted by the district. From the expensiveness of first voting such special taxes and afterwards collecting them, districts, except when desirous of building school houses, are very loath to avail themselves of this provision of the law.

Our public schools stand thus where they stood at the beginning of the session of the legislature in 1869. And the same demand then made is made of the legislature to convene in December, 1873: Sufficient and equal school facilities for every district of the State, small or large, rich or poor, situated in the centres of wealth and population or in the frontier and the thinly settled portions of our State.

No argument is necessary to prove that any system which falls short of providing at least an eight months school for every district of the State, is but a partial system; and the chief point that should engage the attention of the legislature of 1873–74 is to provide the ways and means for giving each district sufficient funds to maintain at least an eight months school. The people will gladly welcome any step in this direc-

tion; they are willing, and have proven it, to cheerfully bear the taxes, burdensome though they be, necessary to this end. The people only ask for the cheapest mode of collecting, and the quickest, most equitable and efficient methods of disbursing, the school funds. They ask to be relieved from the necessity of having to vote a tax for two dollars, when one dollar is all they will receive, after paying for the advertising, voting, assessing and collecting of the tax. In short, the people demand that either the State alone, or the State and county jointly, furnish the funds needed for our public schools.

It has been held by some that the State alone should contribute the means to educate all the children of the State. However just and desirable in theory, the fact remains that no legislature ought to be asked to impose a direct tax upon the property of the whole State sufficient for the purpose. When a county like San Francisco must contribute 40 per cent. toward the State school fund, and receives in return only 24 per cent. from all the State apportionments, there must certainly be a limit beyond which San Francisco ought not to be expected to support the schools of other counties. As long as the taxable property of the State is not about equally distributed throughout the State, but centres in a few counties, all we can expect, all we can justly ask for, is, that the richer counties help the poorer counties sufficiently not to compel the latter to overtax themselves in the support of their schools. To ask more, is to endanger any relief the legislature may be willing to grant. Table I exhibits for each county, first, the assessment roll of 1873; secondly, the percentage of this assessment roll on the total assessment roll of the whole State; thirdly, the number of census children for 1873, and fourthly, the percentage of this on the total number of census children for the whole State. The percentage of a county's assessment roll on the total assessment-roll of the State, will show, approximately, the percentage of the county's contribution to the proceeds of State taxation; the percentage of the county's number of census children on the total number of census children of the State, will show the percentage of the county's receipts from the State school fund.

TABLE I.

Counties.	Assessment Roll of 1873.	Percentage.	Total Number of Census Children for 1873.	Percentage.
Alameda	$35,104,040	6.66	6,751	4.77
Alpine	576,186	0.11	113	0.08
Amador	2,738,770	0.52	2,134	1.51
Butte	7,793,497	1.48	2,707	1.91
Calaveras	1,558,227	0.29	2,215	1.56
Colusa	7,604,044	1.44	1,686	1.19
Contra Costa	7,016,111	1.33	2,603	1.91
Del Norte	632,780	0.12	348	0.25
El Dorado	2,117,376	0.40	2,304	1.63
Fresno	6,598.645	1.25	1,055	0.75
Humboldt	3,845,120	0.73	2,059	1.45
Inyo	1,386,351	0.26	294	0.21
Kern	3,013,310	0.57	614	0.43
Klamath	613,927	0.12	276	0.19
Lake	1,670,723	0.32	1,021	0.72
Lassen	1,213,321	0.23	554	0.39
Los Angeles	9,854,593	1.87	6,101	4.31
Marin	8,438,173	1.62	1,410	0.995
Mariposa	1,371,970	0.24	956	0.68
Mendocino	5,061,823	0.96	2,407	1.70
Merced	6,3379,62	1.20	927	0.65
Mono	454,259	0.08	90	0.06
Monterey	11,372,935	2.15	3,643	2.57
Napa	7,580,789	1.44	2,109	1.49
Nevada	7,144,450	1.36	4,154	2.93
Placer	7,145,479	1.36	2,166	1.53
Plumas	1,767,261	0.34	761	0.54
Sacramento	20,912,287	3.97	5,425	3.83
San Bernardino	1,411,649	0.27	1,562	1.10
San Diego	2,941,864	0.56	1,297	0.92
San Francisco	212,208,535	40.45	34,469	24.34
San Joaquin	18,279.459	3.47	4,609	3.25
San Luis Obispo	3,662,998	0.71	1,633	1.15
San Mateo	9,379.682	1.78	1,978	1.33
Santa Barbara	4,967,837	0.94	1,706	1.21
Santa Clara	27,527,613	5.22	6,762	4.78
Santa Cruz	6,223,470	1.18	2,677	1.89
Shasta	1,799,427	0.34	1,327	0.94
Sierra	2,016,789	0.38	980	0.70
Siskiyou	3,691,798	0.70	2,400	1.70
Solano	9,908,045	1.88	3,716	2.63
Sonoma	16,713,094	3.17	5,899	4.18
Stanislans	6,441,864	1.22	1,712	1.21
Sutter	4,178,008	0.79	1,290	0.92
Tehama	3,437,332	0.65	1,194	0.84
Trinity	691,929	0.13	530	0.37
Tulare	3,546,682	0.67	1,751	1.24
Tuolumne	1,333,350	0.25	1,794	1.27
Ventura	2,682,542	0.59	2,119	1.50
Yolo	8,370,712	1.59	2,385	2.00
Yuba	4,886,740	0.93	937	0.66
Totals	$527,225,828		141,610	

Before we can consider the manner and means of remedying the inadequacy of the present school revenue law, we must first consider the *disabilities* of the law. For it is only in relation to certain districts that the present school revenue law is inadequate; there are numerous districts which, with the present levies for school purposes, have abundant means to maintain an eight months, yes a ten months school every year. The law is not so much inadequate as discriminating; discriminating most unjustly against the thinly populated districts of the State. The law is faulty, not so much primarily, by not providing sufficient funds, as by not providing for an equitable apportioning of the funds. At present the State and county school funds are apportioned to the school districts, not in proportion to the needs of each district, but in proportion to the number of census children. The number of census children belonging to a district determines the amount of funds apportioned to the district; but, within a certain limit, the number of census children does *not* determine the expenses of maintaining a public school. Thus one district may have fifteen census children, another fifty; still the same amount is needed by each district to maintain a school for a definite length of time. Yet the former district may not obtain enough funds for a three months school, while the latter district perhaps receives enough funds for an eight months school. To give a specific example: in Solano county, where the total amount per census child of State and county school funds was last year in round figures sixteen dollars, a district with fifteen census children received $240, just enough for a four months school, if the money was used exclusively for the payment of the teacher's salary, and this salary did not exceed sixty dollars per month. The district having fifty children raised $800, sufficient for an eight months, yes, a ten months school, besides enabling the district to employ a better teacher by paying a better salary, to make some repairs and improvements, or to make some additions to the apparatus or the library, if needed, things which were placed within the reach of the former district only by means of voting a special tax. In short, the largest schools, the best schools, the best teachers, the best and most complete furniture, apparatus and library are given to the district having a sufficient number of census children; whilst a district wanting these is pro-

portionally curtailed in its educational facilities. Now, except there is an inherent right in numbers to warrant it, such discrimination is a blot upon our school system, and should, if possible, immediately be removed, or our system fails in the object by reason of which alone it can claim our recognition and support: the free and equal education of *all* the children of the State, irrespective of the standing in society, or the residence, of their parents.

On first sight it might seem that increased taxation would be the most expeditious way of finding an adequate remedy. Let us see. In order to agree upon the end in view, let us assume that an eight months school for *every* district, irrespective of its number of census children, is the desideratum. It is plain if we obtain funds sufficient for a district having the minimum number of census children, we shall have sufficient funds for every district. No minimum number of census children has been established by law; let us therefore assume fifteen to be the minimum number, although there are quite a number of districts having less than fifteen children, and there is one district which has only ONE child. In the summaries fronting the report, $699 is given as the average amount needed for an eight months school, for every teacher employed. For large districts maintaining first grade schools, this average is below the amount needed; but for a district with fifteen children, it is most likely in excess of the amount needed. Let us assume, then, that a teacher is engaged for sixty dollars per month, we need $480 for salary; add $20 for fuel, repairs, stationery, and library fund deducted from State apportionments, and we have $500 needed by the district to maintain an eight months school. It may be here remarked, parenthetically, that throughout this whole article $500 is assumed to be the amount needed for an eight months school, for every teacher employed. In order, then, to give a district having fifteen children $500, we must apportion nearly $34 per census child, which means that we must raise by county and State taxation nearly $5,000,000, exclusive of what may be needed for building purposes!* Now even if the attempt to raise such a sum were not preposterous, the larger districts, that is those having more than fifteen cen-

* In San Francisco, $35 to each pupil, on average attendance of preceding year, was raised by city taxation.

sus children, would be surfeited with funds. A city like Oakland would receive $102,000, $43,402 more than it expended last year for a ten months school. We must therefore abandon the idea that we can increase the State and county school funds sufficiently, that, when they are apportioned to the several districts in proportion to the number of census children, each district will receive even only the minimum amount, $500, needed for an eight months school.

It was shown above that, within certain limits, the expenses of maintaining a school a stated length of time are the same, be the district large or small. This will furnish us with the data for devising a method of apportioning school funds by which all districts may have equal school facilities, without the necessity of levying excessive taxes. In other words, if we determine once the limits between which the expenses of maintaining a school are the same, irrespective of the number of census children in the several districts, we have the data necessary for devising a proper method of apportioning school funds.

How can we determine these limits? The number of census children belonging to a district do *not* determine the expenditures for school purposes. The average number attending the schools of the district determine the number of teachers needed, and the number of teachers determine the expenditures. A district having from four to five hundred census children, may have an average attendance at school of only forty, and need the services of only one teacher; whilst another district, with only half or less the number of census children, may have an average attendance at school which necessitates the employment of two or even three teachers. Such cases are not mere suppositious, but they are *real*. One district, of the first kind, had thus accumulated several thousand dollars, which were lying idle in the treasury, whilst every other district in the county had to close its school for want of funds.

But it would be inconvenient to make the average attendance at school the basis of apportioning school funds. It is preferable, for various reasons, to still apportion according to the number of census children, but not in proportion to the number, but taking as basis *the number of census children represented by the average attendance at school*. Except as between counties in appor-

tioning the State school fund; for as in no county the average attendance, nor even the total number enrolled, equals, much less exceeds the total number of census children, it would be an injustice against those counties which, as it is, contribute more towards the State school fund than they receive in apportionments, to lessen their receipts by abandoning the present method of apportioning. This may not seem clear on first thought; but the fact is—no matter how accounted for—that the average attendance is less than the number of census children, in proportion to the density of population and the length of school terms. Such a county as San Francisco would lose nearly five per cent. by having the proposed method substituted for the present method, in apportioning the State school fund between the counties. The proposed method of apportioning must therefore be applied only to the districts of a county.

It is shown, in the introductory summaries, that the average number of census children belonging to public schools is 55.35 per cent. on the total number of census children. If we include —as we should, for we must provide for their education also— the number of children over fifteen years of age who attend public schools, the percentage of the average attendance is only very slightly increased, being even now but 55.36. So that for all practical purposes we may restrict ourselves to the average number of *census* children belonging to public schools. Of every one hundred census children, then, belonging to a district, only fifty-five attend school, a number perhaps a little large for one teacher, but certainly too small for two teachers. But should a district have over one hundred up to two hundred census children, the average number belonging would necessitate the employment of at least two teachers. As a *general* rule, it may be safely laid down that for every additional one hundred census children belonging to a district, an additional teacher must be employed. That this rule will not work in every case, will be evident, for in every district the percentage of the average number belonging is not as low as the average percentage of the whole State. And then in the larger cities, the special teachers of music, drawing, penmanship and phonography, the supervising teachers, and teachers of evening schools, added to the number of regular teachers in charge of classes,

may change the number of teachers from one to two for one hundred census children. (In San Francisco one teacher is employed for every sixty-eight census children; in Oakland, one teacher for every fifty-five children; for the whole State, one teacher for every sixty-five census children.)

Thus it may be that for some districts, and especially for the larger incorporated towns and cities having Boards of Education, one teacher must be reckoned for every sixty-eight or less of census children; but if sixty-eight or even seventy five were adopted as the basis upon which to calculate the number of teachers to be reckoned to each district, I have found from an actual and thorough examination of the reports for 1873, that the number of districts which would receive the number of teachers actually employed by them, would be far over-balanced by the number of districts which would receive an allowance of teachers in excess of the number at present employed by them. And this, as will soon be clear, at the expense of the larger districts.

The proposed method of apportioning State and county school funds is, then, that for every hundred census children or fraction thereof, one teacher be allowed to a district, and for every teacher a certain amount of school funds. As an illustration let us take Alameda County. Alameda District having 405 census children, will be entitled to five teachers, viz: one for each one hundred children, and one for five children, as a fraction of one hundred children. Below, a complete table for the whole county is given. In the first column are given the names of the districts; in the second column the number of census children in each district; in the third column the number of teachers each district will be entitled to according to the proposed method of apportioning school moneys; in the fourth column are given the amounts which each district is entitled to according to the present method of apportioning; and the fifth column gives the amount each district will receive according to the proposed method of apportioning.

TABLE II.

NAMES OF DISTRICTS.	Number of Census Children in District.	Number of Teachers to District.	Amount according to present method of apportioning.	Amount according to proposed method of apportioning.
Alameda	405	5	1,215	1,160
Alvarado	134	2	402	464
Alviso	82	1	246	232
Bay	58	1	174	232
Castro Valley	51	1	153	232
Centreville	106	2	318	464
Cosmopolitan	64	1	192	232
Eden Vale	52	1	156	232
Eureka	116	2	348	464
Fruit Vale	109	2	327	464
Inman	63	1	189	232
Laurel	289	3	567	696
Lincoln	29	1	87	232
Livermore	168	2	504	464
Lockwood	72	1	216	232
May	75	1	225	232
*Mission San José	87	1	261	232
Mountain House	61	1	183	232
Mowry's Landing	46	1	138	232
Murray	44	1	132	232
Oakland	3,006	31	9,018	7,192
Ocean View	128	2	384	464
Palmyra	40	1	120	232
Peralta	149	2	447	464
Pleasanton	132	2	396	464
Redwood	32	1	96	232
San Lorenzo	163	2	489	464
Stony Brook	18	1	54	232
Suñol	61	1	183	232
Summit	37	1	111	232
Temescal	142	2	426	464
Townsend	69	1	207	232
Vallecito	72	1	216	232
Washington	109	2	327	464
Warm Springs	75	1	225	232
Union	401	5	1,203	1,160
Totals	6,751	87	$20,253	$20,184†

* Midway, a district lying partly in Alameda County and partly in San Joaquin County, is excluded from the above. It reports six census children belonging to Alameda County.

† The balance, $69 00 unapportioned, remains in the treasury, and is to be added to the next State apportionment.

Every State apportionment received by Alameda County will have to be divided by 87, the total number of teachers accord-

ing to the proposed method of apportioning. Assuming that Alameda County receives from State apportionments $3 per census child (the probable amount for 1874), it will have $20,253 to apportion among its districts. According to the present method of apportioning, each district would receive $3 for every census child; according to the proposed method, every district will receive $232 (20,253 ÷ 87 = 232) for every teacher assigned it. Thus Stony Brook District, which by the present method receives from State and County apportionments combined only about $157 50, not enough for a three months school, will receive, by the proposed method, $232 from the State alone, enough for nearly a four months school. Of course, some of the more populous districts will lose in proportion as the smaller districts gain; and from the above table it will be seen that every district having seventy-seven children or less, or a multiple thereof, gains, and the other districts lose proportionally. If it be objected that this works an injustice against the larger districts, the answer is, first, that a district does not necessarily contribute in taxes towards the school fund in proportion to its number of census children; from Table I (*supra*) it will be seen that Colusa County contributes more in taxes to the school fund than Contra Costa County, and yet the former receives less from the apportionments than the latter; in other words, Colusa County, with a larger assessment roll but smaller school population, contributes more to and receives less from the school fund, than Contra Costa County, which has a smaller assesment roll but a larger school population. The same is more strikingly exhibited between the counties of Napa and Nevada, both of which contribute almost equally to the State school fund, yet the latter, on account of its larger school population, receives twice as much from the State apportionments as the former. And what is true between counties, may also be true between districts. Secondly, our whole State school system is based upon the theory that the richer and more populous counties may be taxed for the benefit of the poorer and more thinly settled counties. If we admit that the distribution of school funds between the districts must proceed upon the principle that the apportionments must be in proportion to the proceeds of local taxation, the same principle must be applied to

the distribution of school funds between counties, and a State school system becomes then impossible.

It must not be concluded that because in Alameda County each district will receive, by the proposed method of apportioning, $232 for every teacher assigned it, that this is the rate for the whole State. In Table III, given below, is given the rate for each county. In Mono County the rate is as low as $67; in only one county (Santa Barbara) is it higher than in Alameda County.

But even this rate is not high enough to supply sufficient funds for an eight months school. It was above stated that $500 must be considered as the minimum amount necessary for this. In Alameda County, then, additional funds of $268 must be provided for each teacher assigned to a district. If, for a moment, we assume that this amount must be raised solely from the county school fund, it would seem that we simply have to take $87 \times 268 = \$23,316$ from the county fund, and apportion this among the districts according to the proposed method of apportioning State school funds. Further on I shall show that only $87 \times 221 = \$19,227$ will be actually necessary in order to give each district enough county funds, which, together with the State fund, will make up the $500 required for every teacher. But this reduction from $268 to $221 is only possible because Alameda County has a county school fund of at least $23,316. It had in fact, for 1873 and for 6,496 census children, a school fund of $37,352. Assuming that the county school fund for 1874 will not be less, enough funds will be left on hand after deducting $19,227 to admit of a *pro rata* apportionment of $2 68 per census child. This *pro rata* apportionment of $2 68 and the $221 to each district for every teacher, amount to $269, the amount required to be obtained from the county fund for every district having one teacher. Let us take the smallest district in the county, Stony Brook District. It receives first, $221; add to this $18 \times 2.68 = 48.24$, total $269; which added to the State apportionment, $232, gives the district $501, one dollar more than the required amount.

If we had given every district in the county $268 of county school funds for every teacher, there would still be a balance on hand of $14,036; which, divided among the districts in propor-

tion to the census children, would give each census child nearly $2 08. Stony Brook District would then have received 18× 2.08=$37 44 more than the proposed $500. It is plain, therefore, that Stony Brook District, and with it every other district of the county, did not need but 268—37=$231. But as a decrease in the amount apportioned absolutely to the different districts increases the balance on hand, an increased *pro rata* apportionment is the result; and Stony Brook District would then receive 231+(18×2.55)=276.90, $8 90 more than the needed complement. Stony Brook District would need a complement from the county fund of not more than 231—9=$222. A decrease in the complement producing an increase of the balance, and a consequent increase of the *pro rata* apportionment, even $222 are not needed by Stony Brook District; I have found that $221 and a *pro rata* apportionment of $2 68 will give Stony Brook District the required complement of $268 county school fund. Of course for every district having more than eighteen census children, even $221 are not needed; but as a less sum would not suffice for Stony Brook District, we must consider $221 as the minimum amount. Besides, an increase in census children produces an increased attendance, and this again an increased expenditure for school purposes; and the larger districts should receive more school funds than the smaller districts.

It is evident that the original complement, $268, could not have been reduced if after deducting from the county school fund $23,316, the amount required to give $268 to each district for each teacher assigned it, no balance had remained on hand, which, by being apportioned in proportion to the number of census children, would give each district some funds in addition to any absolute apportionment. Hence my statement above, that a reduction of the absolute apportionment (that is, the amount given to each district for every one hundred census children or fraction thereof) is not possible except Alameda County has a county school fund of at least $13,316. Now in some twenty-four counties the county school funds are not large enough to give each district the amount of county money needed to complement the State school money, much less to leave a balance on hand which would reduce that complement.

The following table will make this plain.

TABLE III.

COUNTIES.	Number of Census Children.	Number of Teachers assigned.	Amount per Teacher from State School Fund.	Am't per Teacher to be obtained f'm County Fund.	Residual pro rata apportionment of County Funds.	Deficiency.	Rate of County School Tax levied in 1873.	Am't County Fund per Census Child, apportionm't 1873.
Alameda	6,751	87	$232	$268	$2		10c.	$5.75
Alpine	113	4	84	416	3		25	19.48
Amador	2,134	37	173	327	Insuffic't	$175	30	5.69
Butte	3,707	55	148	352	"	4,836	15	5.54
Calaveras	2,215	41	162	338	"	4,460	35	4.17
Colusa	1,686	40	126	374	"	4,493	10	6.41
Contra Costa	2,603	44	177	323	"	2,889	10	4.59
Del Norte	348	8	130	370	"	59	25	9.21
El Dorado	2,304	45	153	347	"	7,428	25	3.15
Fresno	1,055	23	137	363	3		20	12.37
Humboldt	2,059	37	166	334	Insuffic't	3,342	15	4.65
Inyo	294	7	126	374	5		20	16.25
Kern	614	11	167	333	5		25	14.96
Klamath	276	5	166	334	3		17.8	9.89
Lake	1,021	23	133	367	Insuffic't	3,641	18	4.80
Lassen	554	12	138	362	"	2,247	24	4.97
Los Angeles	6,101	80	228	272	1		25	4.71
Marin	1,410	28	151	349	2		04	8.87
Mariposa	956	15	191	309	.50		35	5.97
Mendocino	2,407	48	150	350	Insuffic't	6,110	15	
Merced	927	21	132	368	6		20	15.88
Mono	90	4	67	432	Insuffic't	256	25	17.72
Monterey	3,643	56	195	305	.50		14	5.39
Napa	2,109	45	140	360	Insuffic't	939	15	7.38
Nevada	4,154	63	197	303	4			9.02
Placer	2,166	47	138	362	Insuffic't	1,529	10	6.94
Plumas	761	24	95	405	"	2,468	50	10.36
Sacramento	5,425	88	184	316	4		06	9.03
San Bernardino	1,562	25	187	313	Insuffic't	1,833	35	3.78
San Diego	1,297	24	162	338	1		20	6.80
San Francisco	34,469						25	35.00
San Joaquin	4,609	88	157	343	1		14	7.40
San Luis Obispo	1,653	26	188	312	Insuffic't	1,233	13	4.90
San Mateo	1,978	29	204	296	3		11	7.62
Santa Barbara	1,706	20	259	241	1.50		14	3.27
Santa Clara	6,762	94	215	285	.75		08	4.58
Santa Cruz	2,677	41	195	305	3		25	8.33
Shasta	1,327	29	137	363	Insuffic't	3,330	35	5.63
Sierra	980	23	127	373	"	712	20	7.79
Siskiyou	2,400	56	128	372	"	2,157	35	9.63
Solano	3,716	61	182	318	6		35	11.74
Sonoma	5,899	109	162	338	.33		18	6.26
Stanislaus	1,712	38	135	365	4			12.98
Sutter	1,290	36	107	393	Insuffic't	7,148	13	5.33
Tehama	1,194	23	155	345	"	456	20	6.51
Trinity	530	10	159	341	1.50		25	8.43
Tulare	1,751	32	164	336	1.33			8.41
Tuolumne	1,794	29	185	315	Insuffic't	1,113	35	4.19
Ventura	937	15	187	313	"	465		
Yolo	2,385	42	170	330	.20			9.00
Yuba	2,119	47	135	365	.80		13	5.90

The first column gives the number of census children for each county; the second column gives the number of teachers assigned each county, in the same manner as eighty-seven teachers were assigned to Alameda County (Table I). The number of teachers gives the divisor by which each State apportionment made to the county must be divided, and the quotient, given in the third column, is the amount to be given to each district for every teacher assigned it. Thus, assuming that a State apportionment of $3 per census child has been declared, Alpine County would receive $339, which would have to be divided by four, giving $84 as the amount per teacher for every district in the county. In the fifth column is given the amount per teacher to be apportioned to each district from the county school fund, which added to the State apportionment, will give the required $500.

In the case of Alameda County it was shown that after apportioning from the county fund to each district $268 for each teacher, a balance remained on hand which if apportioned among the districts in proportion to the number of census children, would give a *pro rata* apportionment of over $2 per census child. In Alpine County, after apportioning to each district $416 for every teacher, there still remains on hand a balance, which, apportioned *pro rata*, will give each census child $3. These *pro rata* apportionments are given in the sixth column. Against some counties is marked "insufficient." Let us consider the first case occurring in the table, Amador County. The amount necessary to be apportioned to each district from the county fund is $352 per teacher, or a total for the county of $19,360. Now this is $175 less than the total amount of county school funds received last year: so that the county school fund is insufficient by $175, to give each district the amount needed per teacher, which added to the State apportionment would give the required $500. This insufficiency of the county school fund is still greater for Butte County, where it amounts to $4,836 (see the seventh column); in El Dorado County it is greatest, amounting to $7,428.

Let us now examine how far this insufficiency can be remedied by increasing the rate of county tax to the maximum, 35 cents, for those counties where the maximum is not already

levied. In the eighth column (Table III) is given for each county the rate of county school tax levied for 1873; in the ninth column the amount of county funds, apportioned per census child, in 1873.

The second column of Table IV (*infra*) shows the maximum amount which can be raised in the several counties under the present law. The amount is determined by levying thirty five cents (the maximum rate allowed by law) on each one hundred dollars of the equalized value of the last (1873) general assessment roll, after deducting fifteen per cent. therefrom for probable delinquencies. Thus in Amador County, $2,738,770 is this year's equalized assessment roll; deduct fifteen per cent., and the remainder, $2,327,955, will give us, at thirty-five cents on each one hundred dollars, $8,148 as the probable amount to be received from general county taxes. Add $4,683, received last year from poll taxes, etc., and we have $12,831 as the probable amount of county school moneys which can be raised if the maximum rate of tax is levied for county school purposes.

The third column shows the amount of poll taxes, etc., paid into the school fund of each county. This amount is found as follows: after deducting the actual delinquency, as shown by the Controller's books, from last year's (1872) general assessment roll, the amount is found which must have been paid into the school fund, according to the rate of tax levied. (Table III, 8th column.) This amount is deducted from the total amount apportioned from the county school funds, and the remainder must have been received from poll taxes, etc. Thus in Amador County, last year's equalized assessment roll was $3,186,750. The actual delinquency, according to the Controller's returns, was $773,000, leaving $2,413,750 as the amount on which taxes were collected. Thirty cents was the rate of the tax levied for school purposes; giving $7,241 as the sum of county school moneys received from the general taxes. The total apportionment of county school moneys was $11,924, leaving $4,683 as the amount received from poll taxes, etc.

The fourth column shows the amount needed by each county, in order to give each district the complement of county school money needed, according to the first column of Table III. Thus in Amador County, each district will receive for every teacher

$173 from the State; $327 per teacher of county school money are needed for each district, in order to give it $500 per teacher. For the whole county we thus need $12,099.

For El Dorado County $13,858 are needed. But the total probable amount of county school funds, the maximum rate allowed by law being levied for school purposes, is only $9,478, leaving thus an "insuffibieney" of $4,480. In other words, El Dorado County, after receiving from the State $6,912 (the probable amount of the State apportionment for 1873–74, as already stated above) and from the county $9,478, the maximum amount which can possibly be raised, still needs a balance of $4,480, in order to have money enough, which, when apportioned according to the proposed method, will give each district $500 for every teacher assigned it. The same occurs in some other counties, as will be seen by referring to the fifth column of Table IV.

TABLE IV.

COUNTIES.	Amount received from County Tax.	Amount received from Poll Taxes and other sources.	Amount needed.	Balance.	Additional Funds needed per Census Child.
Amador	$8,148	$4,683	$12,099	.....	.....
Butte	23,185	3,224	19,360	.....	.....
Calaveras	4,286	5,192	13,858	$4,480	$2
Colusa	22,622	2,403	14,960	.....	.....
Contra Costa	20,873	4,842	14,212	.....	.....
Del Norte	1,883	1,223	2,960	.....	.....
El Dorado	6,299	2,880	15,615	6,436	2.79
Humboldt	11,439	2,617	12,358	.....	.....
Lake	4,970	2,205	8,441	1,266	1.24
Lassen	3,610	187	4,344	547	1.00
Mendocino	15,055	3,487	16,800	.....	.....
Mono	1,351	478	1,728	.....	.....
Napa	22,553	3,843	16,200	.....	.....
Placer	21,258	10,374	17,014	.....	.....
Plumas	5,258	1,067	9,720	3,395	4.47 (1.50)
San Bernardino	4,200	1,559	7,825	2,066	1.32
San Luis Obispo	10,896	2,218	8,112	.....	.....
Shasta	5,353	2,179	10,527	2,995	2.25
Sierra	5,999	3,837	8,579	.....	.....
Siskiyou	10,983	9,800	20,832	49	.....
Sutter	12,430	1,245	14,148	473	0.37
Tehama	10,226	?	.....	.....	.....
Tuolumne	3,967	3,594	9,135	1,574	0.87

To summarize: the amount at present derived from the State school fund, together with the maximum amount of county school fund which can possibly be raised, is not sufficient to give each district of the State sufficient funds to maintain an eight months school, even when putting the expenditures at a minimum. It need hardly be stated that the maximum rate to be levied by a county for school purposes cannot be raised; the maximum is too high as it is for many counties, especially for most mining counties, in some of which the people are now so overtaxed as to demand relief from the State.

It need also hardly be stated that the amount of school fund derived from the State apportionments, is far too small. The inadequacy of the State school revenue has always been admitted: and never more so than two years ago and at present. Almost every County Superintendent draws attention to it in his report; and if a friend of popular education is asked what are the most pressing wants of our public schools, the answer is: "Three things; first, money; second, *money;* and third, MONEY." Though above I waived, for the moment, the considering of the inadequacy of the school revenue law, it was simply to show its full measure. How great the inadequacy is, may be seen from the fact that in Calaveras County at least $2 per census child additional funds are needed. Yes, in Plumas County $4 47 per census child are needed. But if we permit Plumas County to levy a county tax of fifty cents for every one hundred dollars of taxable property in the county (as it now does by virtue of a special law) it will still need $1 50 per census child.

And except we return to the old plan of an *ad valorem* tax on each one hundred dollars value of all taxable property throughout the State, and raise this *ad valorem* tax to twelve cents, we shall never be able to fully remedy the inadequacy of the school revenue law. Even when the State tax is fixed at twelve cents, some counties will have a deficiency of funds, except they are compelled by law to levy the maximum rate; and even then there will be likely a deficiency in one or two counties.

How to remedy the *disabilities* of the school revenue law has been shown above, *in extenso.* To take a step forward, to establish a true system of popular education, *to educate all the children of the State,* we must have sufficient revenue so that

every district in the State, whether situated in the most impoverished county or in the most opulent city, has sufficient funds for an eight months school. Anything short of this is but a pretence of popular education. But for this the funds will never be sufficient except they are equitably distributed.

To insure, then, a thorough instead of a partial public school system, we need, first, a State tax of at least twelve cents on every one hundred dollars of all the taxable property of the State; secondly, the State and County school funds must be apportioned, not as at present, in proportion to the number of census children belonging to a district, but in proportion to the number of times a district has one hundred census children, or a fraction thereof. There must be no aristocracy of *numbers*, as well as no aristocracy of territory or property. All the property of the State or county must be taxed to educate all the children of the State or county, and not merely the children of districts having a certain number of census children.

Before submitting a draft of a school revenue law which will remedy the inadequacy and disabilities of the present law, it will not be amiss to give a table showing the amounts of State and county funds to be apportioned to each district for every teacher assigned it, in case the legislature of 1873–74 should legislate in accordance with what I have shown to be the needs of our schools. I may first, however, parenthetically, answer a question which naturally has been asked by many of my readers, viz: Why do I insist in "assigning" teachers to a district, why not take the actual number at present employed by the districts? The answer is, that in the latter case a district would naturally suppose that its receipts would be in proportion to its number of teachers, and many districts would immediately clamor for additional teachers, and thus an element of strife would be introduced, which, if not defeating the whole system, would yet render its enforcement extremely difficult and wrought with trouble. If, on the contrary, a fixed number of census children is taken as a standard, no district can have an interest in employing more teachers than it unquestionably needs. By such a standard, some of the most populous districts undoubtedly suffer a loss of receipts, but not in violation of equity, as was shown above. This loss of receipts falls upon very few districts, and will be hardly felt by them if the State

tax is raised to the required rate, in which case the loss will be relative, not actual.

If the rate of the State school tax is raised to twelve cents, enough funds will accrue to give an apportionment of $5 per census child. Even with this increased State apportionment, Calaveras, Colusa, El Dorado, Lassen, Mendocino, Mono, Plumas, Shasta and Sutter Counties, will have a deficiency of county funds with which to complement the State school fund; for Sutter, this deficiency amounts to $4,556. This deficiency can only be remedied when the just named counties levy for county school purposes the maximum rate, thirty-five cents, allowed by law. In order to compel Boards of Supervisors to do so, the minimum rate should not be less than sufficient to raise a sum equal to four dollars—instead of three, as at present—for each child in the county between five and fifteen years of age.

I have constructed Table V to exhibit the amounts of county school funds to be apportioned, when a State apportionment of $5 per census child has been made. The amounts of county school funds for 1873 are retained for calculating the county apportionments. Fifteen has been taken to be the minimum number of census children, and five hundred dollars the minimum amount to be raised for every one hundred census children or fraction thereof. In the second column are given the amounts of State school funds to be apportioned for every one hundred census children or fraction thereof; the third column exhibits the amounts of county school funds to be apportioned in the just mentioned manner; the fourth column exhibits the rate of apportionment in proportion to the number of census children, which can be made from a balance remaining in the treasury after the apportionments given in the third column have been made. In the fifth column are given the deficiencies which occur in certain counties.

To illustrate: if a State apportionment of $5 per census child is made, in Alameda county $384 per teacher will be apportioned to each district. A county apportionment of $126 per teacher remains to be given to each district. It was shown above that if the county school fund is large enough to admit of an apportionment in proportion to the number of census children (which may be called the *pro rata* apportionment) after an

apportionment of a definite sum per teacher has been made to each district (which may be called the *absolute* apportionment), the absolute apportionment need not be as large as the difference between $500 and the State apportionment. In the case of Alameda County, the absolute apportionment may be and should be less than $126. In other words, less than $87\times126=\$10,962$ must be apportioned absolutely. As the sum to be apportioned absolutely is unknown, let us call it x. Every district will receive, then, $\frac{x}{87}$ dollars for every teacher assigned it. As the county school fund of 1873 amounted to $37,352, a balance of $37,352-x$ remains to be apportioned *pro rata*. The number of census children being 6,751, the rate per census child will be $\frac{37,352-x}{6,751}$. Therefore a district having the minimum of census children, 15, will receive $\frac{x}{87}+15\left(\frac{37,352-x}{6,751}\right)$, which must amount to $126, the amount to be obtained from the county school fund. The equation determining the value of x, will stand: $\frac{x}{87}+15\left(\frac{37,352-x}{6,751}\right)=126$, from which the value of x is found to be $4,638. This is the sum, then, which must be apportioned absolutely in Alameda County. But as on dividing it by 87, to ascertain the amount per teacher, the quotient is 53 and a fraction, the fraction must be reckoned as 1, and the absolute apportionment will amount to $54 per teacher, and $4,698 will be the sum to be absolutely apportioned. The *pro rata* apportionment will amount to $4 83. A district having 15 children will thus receive $54+(15\times4.85)=\$126$, which added to the State apportionment, $384, will give the district the required $500.

As in Table III, so in Table V, are found several counties against which is marked "insufficient." This means that the county school fund of these counties is not large enough to give each district the amount needed to complement the State apportionment. Thus in El Dorado County, $244 is the amount per teacher, of county school money, which should be apportioned to each district. But the county fund of 1873 is not large enough for this by $2,793. By raising the county school fund to the maximum amount, according to Table IV, every county, except Calaveras, El Dorado and Shasta, will then have sufficient funds. For Calaveras County the deficiency will be only nominal, some fifty dollars; for El Dorado County it will still be some eighteen hundred dollars; for Shasta County it will be some three hundred dollars.

TABLE V.

COUNTIES.	State Apportionments per Teacher.	County Apportionments per Teacher.	Pro rata Apportionments of County Funds.	Deficiency of County Funds.
Alameda	$384	$54	$4.83	.....
Alpine	141	245	9.08	.....
Amador	288	174	2.57	.....
Butte	246	250	0.81	.....
Calaveras	270	230	Insufficient	$42
Colusa	210	290	"	1,133
Contra Costa	295	188	1.17	.....
Del Norte	217	242	2.76	.....
El Dorado	256	244	Insufficient	2,793
Fresno	229	161	7.34	.....
Humboldt	278	214	.73	.....
Inyo	210	117	11.53	.....
Kern	279	73	9.87	.....
Klamath	276	117	7.11	.....
Lake	221	156	1.18	.....
Lassen	230	270	Insufficient	1,043
Los Angeles	356	91	3.58	.....
Marin	251	153	6.40	.....
Mariposa	318	129	3.44	.....
Mendocino	250	250	Insufficient	1,310
Merced	220	71	13.94	.....
Mono	112	488	Insufficient	80
Monterey	325	128	3.13	.....
Napa	234	232	2.28	.....
Nevada	329	46	8.38	.....
Placer	230	224	6.60	.....
Plumas	171	329	Insufficient	644
Sacramento	308			.....
San Bernardino	312	173	1.06	.....
San Diego	261	178	4.08	.....
San Francisco				.....
San Joaquin	307	88	5.81	.....
San Luis Obispo	314	161	1.64	.....
San Mateo	341	62	6.47	.....
Santa Barbara	426	10	4.30	.....
Santa Clara	359	91	4.86	.....
Santa Cruz	326	64	7.36	.....
Shasta	228	272	Insufficient	691
Sierra	213	258	1.96	.....
Siskiyou	214	109	6.48	.....
Solano	304	23	11.56	.....
Sonoma	270	184	3.10	.....
Stanislaus	225	155	7.99	.....
Sutter	179	321	Insufficient	4,556
Tehama	255	213	2.16	.....
Trinity	265	159	5.08	.....
Tulare	273	163	4.29	.....
Tuolumne	309	164	1.82	.....
Ventura	312	159	1.97	.....
Yolo	283	160	3.14	.....
Yuba	216	226	3.91	.....

In computing the amounts of absolute apportionments of Table V, fifteen census children have been assumed as the minimum number of children. Heretofore, when school funds have been apportioned in proportion to the number of census children belonging to a district, it has been well enough to fix no legal minimum. But now, when it is proposed to apportion direct to the districts, irrespective, within certain limits, of their number of census children, the necessity of fixing a minimum becomes apparent.

In the following draft of a new School Revenue Law, fifteen has been considered as the minimum number of census children. It will be hardly just to the true interests of education, to lower this minimum. The minimum sum to be raised for county school purposes has been raised from three dollars to four dollars per census child. Practically this is already done in all but three or four counties; but it may be well to insert it in the law, in order to prevent Boards of Supervisors to lower the rate of tax levied for county school purposes below the rate necessitated by the needs of the schools of the county. The maximum rate of tax to be levied for school purposes has been raised from thirty-five cents to fifty cents on each one hundred dollars of taxable property, in order to meet such cases where by special law the rate has already been raised to fifty cents, as for instance, in Plumas County. The other provisions of the law are above explained in full. The law may be considerably simplified if, in apportioning to the several districts, no distinction is drawn between State and county school funds. This has the further advantage of reducing the amount of the absolute apportionments, in Alameda County for instance, from $384 State and $54 county, total $438, to $424 State and county combined. Another reason for making the suggested modification, is that instead of providing that only the State school fund shall be used for no other purpose than the payment of teachers, this provision of the law ought to be enlarged so that *no* school fund, whether county or State, should be used for any other purpose than the payment of teachers, until at least an eight months school has been maintained in the district. A revenue law, modified in accordance with what has just been said, supplements the "Draft of a new Revenue Law," herewith presented.

DRAFTS OF A NEW REVENUE LAW,

Designed to supply each District with an Eight Months School.

I.

ARTICLE XVIII.—SCHOOL REVENUE.

SEC. 1815. An annual *ad valorem* tax of twelve cents on each one hundred dollars value of all taxable property throughout the State, is hereby levied and directed to be collected.

SEC. 1816. Said tax shall be called and known as the State school tax; and the State Board of Equalization shall, annually, at the same time other State taxes are levied, add this to the other taxes provided by law to be levied and collected, and it shall be annually collected at the same time and in the same manner as other State taxes are collected.

SEC. 1817. The County Superintendent in each County must, on or before the first regular meeting of the Board of Supervisors in September in each year, furnish the Board of Supervisors and the Auditor, respectively, an estimate in writing of the minimum amount of county school funds needed for the ensuing year. This amount he must compute as follows:

1. He must ascertain, in the manner provided for in subdivisions one and two of section 1859, the total number of teachers for the county;

2. He must calculate the amount required to be raised at five hundred dollars per teacher; from this amount he must deduct the total amount of State apportionments less ten per cent., received by the county for the next preceding school year; and the remainder shall be the minimum amount of county school fund needed for the ensuing year, *provided*, that if this amount is less than sufficient to raise a sum equal to four dollars for each census child in the county, then the minimum amount shall be such a sum as will be equal to four dollars for each census child in the county;

SEC. 1818. The Board of Supervisors, except of the City and County of San Francisco, of each county, must annually, at the time of levying other county taxes, levy a tax to be known as the county school tax, the maximum rate of which must not exceed fifty cents on each one hundred dollars of taxable property in the county, nor the minimum rate be less than sufficient to raise the minimum amount reported by the County Superintendent in accordance with the provisions of the preceding section. The Supervisors must determine the minimum rate of the county school tax as follows:

1. They must deduct fifteen per cent. from the equalized value of the last general assessment roll, and the amount required to be raised, divided by the remainder of the assessment roll, is the rate to be levied; but if any fraction of a cent occur it must be taken as a full cent on each one hundred dollars.

SEC. 1819. If the Supervisors fail to levy the tax as herein provided, then the Auditor must, and add it to the assessment roll.

SEC. 1820. All moneys derived from this tax in each county, must be paid into the treasury thereof to the credit of the school fund.

ARSICLE XX.—APPORTIONMENT OF SCHOOL MONEYS.

SEC. 1858. All State school moneys apportioned by the Superintendent of Public Instruction must be apportioned to the several counties in proportion to the number of census children.

SEC. 1859. The County Superintendent must apportion all State and county school moneys as follows:

1. He must ascertain the number of teachers each district is entitled to, by calculating one teacher for every one hundred census children or fraction thereof, as shown by the next preceding school census;

2. He must ascertain the total number of teachers for the county by adding together the number of teachers assigned to the several districts;

3. After deducting ten per cent. from the State apportionments, he must divide the remainder by the total number of teachers for the county, and the quotient will be the amount of State school fund which he must apportion to each district for every teacher assigned it;

4. Deducting the amount of State school fund apportioned to each district for every teacher assigned it, for the next preceding school year, from five hundred dollars, the remainder shall be the minimum amount of county school fund which must be apportioned to each district for every teacher assigned it, and the amount thus found multiplied in the total number of teachers for the county, shall be the total minimum amount of county school fund needed for the county for the ensuing year; *provided*, that if this total minimum amount of county school fund equals or exceeds the total amount of county school fund apportioned the next preceding school year, then the minimum amount of county school fund which must be apportioned to each district for every teacher assigned it, must be found by dividing the total amount of county school fund apportioned the next preceding school year, in the total number of teachers for the county, as shown by the next preceding school census; but if the total minimum amount of county school fund needed for the ensuing year is less than the total amount of county school fund apportioned the next preceding school year, then the amount of county school fund to be apportioned to each district for every teacher assigned it, must be found as follows:

(*a*.) Multiply the difference between five hundred dollars and the State apportionment made according to subdivision three of this section, in the number of census children, and multiply the resulting product in the total number of teachers for the county;

(*b*.) Multiply the amount of county school fund apportioned the next preceding year by fifteen, and the resulting product in the total number of teachers for the county, as shown by the next preceding school census;

(*c*.) Multiply the total number of teachers for the county by fifteen; subtract this product from the total number of census children as shown by the next preceding school census;

(*d*.) Subtract the last product of subdivision (*b*) from the last product of subdivision (*a*); divide the remainder by the remainder of subdivision (*c*); divide the quotient in the total number of teachers for the county, any occurring fraction being taken as one; and the resulting quotient will be the amount in dollars, to be apportioned to each district for every teacher assigned it;

5. Any county school fund remaining on hand after each district has received for every teacher assigned it the amount of county fund due it according to subdivision four of this section, must be apportioned to the school districts in proportion to the number of census children.

II.

Article XVIII remains the same as given above. Article XX is modified to read as follows:

SEC. 1858. Same as given above.

SEC. 1859. The County Superintendent must apportion all State and county school moneys as follows:

1. He must ascertain the number of teachers each district is entitled to, by calculating one teacher for every one hundred census children or fraction thereof, as shown by the next preceding school census;

2. He must ascertain the total number of teachers for the county by adding together the number of teachers assigned to the several districts;

3. Five hundred dollars shall be the minimum amount to be apportioned to each district for every teacher assigned it, and must be apportioned to each district in the following manner:

(*a*.) He must ascertain the minimum amount of school funds required for the county, by multiplying five hundred dollars in the total number of teachers for the county;

(*b*.) If this minimum amount exceeds or equals the total amount of school funds, both State and county, apportioned the next preceding school year, then the amount to be apportioned to each district for every teacher assigned it, must be found by dividing the amount of school funds apportioned the next preceding school year, in the total number of teachers for the county, as shown by the next preceding school census;

(*c*.) If the minimum amount of school funds needed for the county, as ascertained in subdivision (*a*) is less than the total amount of school funds apportioned the next preceding school year, then the amount of county school fund to be apportioned to each district for every teacher assigned it, must be found as follows:

(1.) Multiply five hundred dollars in the number of census children, as shown by the next preceding school census, and multiply the resulting product in the total number of teachers for the county;

(2.) Multiply the amount of school funds apportioned the next preceding year by fifteen, and the resulting product in the total number of teachers for the county, as shown by the next preceding school census;

(3.) Multiply the total number of teachers for the county by fifteen; subtract the product from the total number of census children as shown by the next preceding school census;

(4.) Subtract the last product of subdivision (2) from the last product of subdivision (1); divide the remainder by the remainder of subdivision (3); divide the quotient in the total number of teachers for the county, any occurring fraction being taken as one; and the resulting quotient will be the amount in dollars to be apportioned to each district for every teacher assigned it;

4. Any school fund remaining in hand after each district has received for every teacher assigned it the amount found due it for every teacher according to subdivision three of this section, must be apportioned to the several districts in proportion to the number of census children.

THE

CALIFORNIA TEACHER.

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CIRCULATION OF WATERS ON SURFACE OF THE EARTH.

III.

Let us now pass from the attracting power of the sun and moon to another impetus or force which they possess, namely, their heat. And as we above designated the former power as immeasurably small with the planets, so now in the latter case, we may omit all mention whatever of the moon; which, though it does not generate cold, as used to be thought, still its heat is so inconsiderable that only very recently it has been positively proved to possess any. In treating this latter point, then, that of heat, the only body deserving of notice is the sun, whose heat is so great that in one year it could dissolve a crust of ice a hundred feet thick, enveloping the whole earth. With every degree of heat, the water, the sea, too, on the surface, is changed into an aeriform, invisible body, which we call vapor, and which remains hidden from our view till it again returns condensed as fog, or a cloud. This evaporation increases with an increased extent of surface and a higher degree of heat; it is therefore greatest in the torrid zone. Incorporated with the air, the vapor, ascending from thence to the height of the atmosphere, becomes dense according to the degree of cooling, turning to rain, or snow, or dew, or hoar frost on the ground. To this process we apply the terms distillation and sublimation. As in the evaporation of water, it leaves behind it all the sub-

stances which it dissolved while in contact with its firm bottom, so rain water, being distilled water, is pure. If by an artificial extending of the superficies we increase the volume of evaporation, as they do in the south of France to gain the sea salt, we can closely inspect this uninterrupted chemical analysis. The atmosphere is then, as its name shows, a great steam-apparatus, whose reservoir is the ocean, its furnace the sun, and whose condensing vessels are the higher geographical latitudes. If the rain falls immediately back into the sea again, it diminishes the pungency of the saline ingredients, which evaporation has intensified; and old sailors tell us that this is the case in the rainy season in so marked a degree, that in a calm, drinking water may be skimmed from the surface of the sea. For this reason the sea is less salt in the vicinity of the equator, in the region of calms, than in that of the rainless whirlwinds; it diminishes again in the tropics, where the sinking whirlwind induces new falls, the so-called sub-tropic rains. But if on the other hand the rain falls on the land, if the soil is porous it penetrates; or should the soil be rocky, or clayey and imper vious to water, it flows off to a lower lying level.

Now the surface of the earth is composed of strata lying one upon the other, till down into the deepest depths; those on the plain are disposed horizontally, while, on the other hand, those on the mountains take an inclined or sloping position. The gaping edges of those layers, the so-called strata-heads, can be seen best on the summits of the mountains; as if, in the heaving of the great bulk, the outer covering of the strata had been disturbed, and the bursting mass had hardened into the form of the crystalline rocks. The watertight and the porous strata alternating, the former fill with water when the rain falls on the exposed formations. The French have a good expression for such a spongy stratum, and call it *une nappe d'eau*. You can make the whole arrangement pretty clear to yourselves by a very simple contrivance. Take a pile of alternating sheets of dry writing-paper and well soaked blotting paper, and then bend up the whole upper part of the book thus formed, out of its horizontal position. You thus gain not a bad idea of how the strata look at the top of a mountain. Farther: if you join two vessels at the bottom by a cross-pipe, and pour water into

the one, the water in the other will rise as high as in the first, no matter how it may differ in size and capacity, nor how long the pipe is. If you lead a pipe through a dike by the sea shore, and curve it round, the water will rise to the sea level even though the pipe should end in a quill. Add one drop, and the whole ocean rises, naturally in proportion to its expanse. This is called the law of the communication of tubes; of such tubes the U-shaped offers the simplest illustration. This law of course holds good for any number of vessels connected by tubes. Such are the Suterazi of the Turks, who, when they desire to conduct water from the one hill to the other, carry a pipe down the one hill, right across the valley, and up the ascent of the second. Had the Romans been acquainted with this principle, they would not have reared their splendidly-arched aqueducts, which bear a more brilliant testimony to their feeling for art than to their knowledge of physics.

The arrangement for providing all larger towns with water is only an imitation of these Suterazi. A main reservoir is almost filled up with water, the connecting pipes branch off as required, under the street pavement, and from these the communicating pipes are conducted into the houses, and carried to a height which of course does not exceed the level of the main reservoir. The effort to rise is everywhere equal, and the upper wall of the horizontal part of the pipes, therefore, has to withstand a pressure from below upwards. If it cannot withstand the pressure, the water oozes out, and a source is found. For, indeed, what else are those *nappes d'eau*, but the water in those pipes, the walls of which are formed by the water-tight layers? Hence the springs ooze out at the foot of the mountains exactly where the upper covering has cracked, in making a bend round. But the spring is often to be found at a greater distance from the base; where, for example, the stratum comes to an end in the plain, or has been burst at some point. If the strata are disposed horizontally on either side of a so-called erosion-valley the water issuing thence can have no ascending power, unless the layers assume an inclined position at a greater distance. Those valleys lined with sloping layers fall into three divisions, viz: into concave or basin-shaped, in which the strata of both walls dip towards the valley; divergent valleys, where this is

the case only on one side, which presents a succession of strata, sloping gently downwards, and the other a steep descent laying bare the heads of the layers; and lastly, chasms, in which the heads of the strata are turned to both sides of the valley, and slope off to the outside. From this, it is to be expected that springs may be found on both sides in the basin-shaped valleys; in the divergent valleys only on the sloping side, and in the chasm not at all; as the rain falling on the heads of the strata would simply feed the springs of a neighboring valley. But nature has frequently neglected to make the opening for the spring to bubble forth, and man must come to her aid, by breaking through the upper stratum with a ground-auger, and in this manner get a well, an Artesian well, so called from the province of Artois, where they were first introduced into Europe, in the year 1126. The ascending power of the water naturally depends on how high the curve of the layer is filled with water. As long as the auger is boring in the upper stratum it remains dry, but immediately fills with water as soon as the last wall is pierced, just like those pipes laid in our houses as a protection against fire, which, being left empty in winter to prevent freezing, fill instantly the obstruction is removed. If the *nappe d'eau* has no side bent upwards, *i. e.*, if it is filled merely by lateral infiltration, then on reaching the water we get only a well, to obtain the water out of which, it has to be drawn or pumped to the surface. If the spring has been bored in a high-lying region, it is possible the water does not rise to the surface at all, but remains at a certain depth, corresponding to the point of issue of the stratum in the mountains. If the water-tight layer over the porous one were quite wanting, the water, if it possessed any force to ascend, would do so of itself. In this case it would be useless to add a new bore to the many already made.

The irrigation of the deeper-lying oases in Sahara seems from the most ancient times to have been effected by means of Artesian wells. Shaw says of Wad-rag—a collection of villages at the entrance of the Sahara—that these villages have no springs, the inhabitants procuring water in a peculiar manner. They dig wells, a hundred or even two hundred fathoms deep, till they find under the sand a stone resembling slate, under which

the Bahar taht el erd, that is, the water is found under the earth. This stone is not difficult to pierce, which being done, the water bursts forth so suddenly and in such abundance, that the men who have been let down frequently perish, though drawn up as quickly as possible. Olympiodor tells of the digging of such deep wells in the great oasis. They are called Bahr in the erosions of the lower plateau; on the plateau itself, Schreia.

When in the year 1844 after the battle at Meggarin, General Desvaux was encamped in the oasis Sidi Rasched, he remarked that on one side of it the palm trees looked poor and shabby, while they were sound and flourishing on the other. On enquiring into the reason of this peculiar appearance, he was informed that there was a scarcity of water, the chief well having fallen in; and as they possessed no means of digging a new one, they were awaiting the day when their palms would cease to bear fruit, and they should all die of hunger. It was Allah's will. The General, on his own responsibility, concluded to send to France for a boring apparatus; an engineer from of Degousee in Paris, was summoned. He found the matter practicable, and the following winter, after a division of Spahis had worked for four days, a spring bubbled forth out of the deserted shaft, bringing 4,300 litres of water a minute. The inhabitants rushed in crowds to the blessed spring, bathing their children in it. Now came petitions from all the other oases for similar favors, and since then some fifty wells have been brought into use without visibly diminishing the volume of water in those already dug. The love of exaggeration now prevalent has led many to express a hope, that in the above manner the desert would, in course of time, be changed into a lovely garden.

The abundance of water in a spring may be exceedingly embarrassing. A considerable number of years ago, an Italian proprietor had an Artesian well dug in his grounds, but it proved to be so powerful that it inundated his own and his neighbor's estates. All endeavors to stop the spring were unsuccessful; and the lawsuit for damages in which this involved him, completed his ruin. The story of Goethe's Zauberlehrling was realized on him to his misfortune. Frequently the water-tight stratum runs away over the tops of the mountains and

the heads of the porous layers, which are then prevented from filling with water. This was the case in Marseilles, where the fruitful soil of the vineyards was often entirely washed away by the thunder-plumps (rain spouts). It struck the vintagers to bore deep holes through the upper stratum of clay, and to construct channels into which to carry the rain-water; and since that time springs about the circumference of a man's arm, which were unknown before, have formed at the harbor. In the year 1831 the fountain in the cathedral square in Tours cast up branches and shells from a depth of 335 feet.

Can we still doubt, in the face of those facts, that the water which oozes forth in natural springs is originally Tagewasser (daylight-water; the water which penetrates into a mine from the upper strata) as the miners call it And who knows it better than they, they who keep up an unceasing struggle to get it under, who construct pits and channels over the pits and mines in order to prevent it breaking in, by carrying it off rapidly; and who after a heavy shower of rain see it appear, first in the lower, and afterwards in the lowest depths. How many sources dry up after long drought, many so frequently as to get the name of "hunger-springs," by way of contrast with those in Switzerland in spring, and which on the first dissolving of the snow burst forth everywhere. And yet there are still to be found adherents of the so-called capillary system. We know it is true that in a narrow tube the water, with a curved concave surface, stands higher than in a wide vessel into which the tubes are introduced; but the water can be higher only as long as the surface is hollow; if it has run out, the surface must first be equalized; that, however, can never be, because then the condition of standing higher no longer exists. You see in dipping a bit of sugar into your coffee, it imbibes the coffee, but no coffee spring will ever bubble forth out of it.

But we are told that in the hot summer of 1822 the waters collected in unusual quantities at the bottom of the mines in the Hartz Forest, while on the surface all the springs ran dry. How easy it was to explain this by saying, that the earth, loosened and cracked by the heightened temperature, its natural capillary tubes were so much widened that they could no longer raise the water to the surface, hence it was compelled to col-

lect at the bottom! This explanation is certainly simple, but simpler still the following: that as those waters were raised by means of mill-works driven by springs, on the drying up of those springs, the works stood still and could not raise the waters!

[*For the California Teacher.*]

PHYSIOLOGY OF THE BLOOD.

Although physiologists of ancient times considered the blood as playing an important part in the animal economy, and although in somewhat later times considerable attention was paid to the study of it, it was not till the microscope was placed in the hands of the naturalist that any exact knowledge of its nature was attained.

By aid of the microscope we perceive that the blood is not a homogeneous fluid, but a mixture of ingredients differing greatly from each other in nature. The blood is water holding in solution albumen, fibrine, fatty and saccharine substances, and several alkaline salts; it also floats vesicular globules composed of hematosine, globuline and some other albuminoids, phosphureted fatty substances, earthy salts and one compound salt containing iron. Thus the simple ingredients which appear to be essential to its constitution are oxygen, hydrogen, carbon, nitrogen, sulphur, phosphorus, chloride of sodium, iron, potash, soda, calcium and magnesium. Thus we see that the blood contains every element necessary for the building up of the tissues of the body.

These furnish compounds of two kinds; the one combustible and consequently combining easily with oxygen, thus creating new products; the other consisting of substances that have already undergone combustion, and consequently are not affected by this principle of oxygen; the fatty and saccharine matters belong to the first class, the water and inorganic salts to the second.

The compound substances of the blood remain therein for a longer or shorter time and then disappear, having suffered destruction, expulsion from the system, or been employed in the building up of the tissues of the body. There is no invariable

standard regulating the proportion which they must maintain to each other, yet each zoölogical species has its own general standard, variations from which beyond certain limits denote variations from the normal standard of health.

The *temperature* of the blood is independent of the surrounding atmosphere; it is the result of chemical processes taking place within it; in man it is from 37° to 38° centigrade, while in birds it is about 4° higher; in the lower vertebrates it is but little higher than the surrounding medium.

There is a general relative proportion of the *weight* of the blood to the weight of the body; this proportion varies in different animals, being greatest in those which present the highest degree of physiological activity or vitality; in animals of the same species the relative weight of blood in those below the average size, is greater than in those of abnormally large growth. In man about one twelfth or one thirteenth of the weight of the body is blood, in woman a little less; in children about one nineteenth. Abstinence from food diminishes the quantity of blood in the body; the same occurs in certain pathological conditions of the system.

The *function* of the blood is to build up the tissues of the body, and to carry away worn-out particles; it is contained in a system of tubes which are impermeable, except for the interchange of matters between the blood and the more solid flesh.

The *color* of the blood is not uniform, but may vary many shades in different individuals, in the same individuals in different parts of the vascular system, and at different times.

Let a drop of blood be magnified from 300 to 400 times, and it will appear to consist of a multitude of corpuscular elements, while the fluid in which they float is betrayed only by the swimming motion of these little bodies. The *fluid* is called the *plasma* or *serum* of the blood, and constitutes about three quarters of its volume; the *corpuscles* are called *blood-cells*, and constitute about one-eighth of the volume of the blood—that is, when they are separated from it, and become dried; Lehmann thinks that in the living blood they constitute at least one-half.

RED BLOOD-CELLS.

The red blood-cells represent the most remarkable feature of

the blood as we examine it under the microscope; it is to them that the blood owes its color, and they form a dividing line between the Vertebrates and the Invertebrates, never being found in the latter. They are but little more dense than the liquid in which they float, which liquid they render more opaque, while they diminish its fluidity but little.

Minute as these little bodies are, measuring in man but about the 250th of a line in diameter, they are, nevertheless, of a very composite character. Two of their constituent parts are globuline, an albumen-like substance, and hematosine, which is also an albuminoid, and is found combined with iron. These two substances are both easily dissolved in water, but the serum of the blood holds in solution certain ingredients which combined render these substances insoluble, and thus the blood-cells remain intact.

The blood-cells were formerly supposed to owe their red color to iron; experiment, however, has proved that the blood deprived of all iron still retains its color; and since this has been proved, physiologists have sought, and sought in vain, for the true coloring principle of the blood; modifications of its color have been referred to modifications in the form of the cell at different points of its circulation, to hematosine and to the gases of the blood.

The blood-cells appear to be minute chemical laboratories within which the work is accomplished of effecting certain chemical changes in those substances which are held in solution in the fluid surrounding them, and having performed their allotted labor, they cease to exist. They play an important part in the phenomenon of respiration, acting as storehouses or condensers of oxygen; the oxygen is apparently absorbed by the plasma or serum, which then delivers it up to the keeping of the globules; these condense the oxygen, without changing it chemically, and carry it to every part of the system.

In the different classes of Vertebrates the red blood-cells vary in *form*, *size*, and *structure*.

I. In the Mammalia they are circular, while in oviparous vertebrates they are elliptical; exceptions to this general rule exist in the camel, llama and chameleon, which have elliptical blood-cells, while in a few of the lowest order of fishes they are circular.

II. They are smallest in the Mammalia, and increase in size in an order exactly corresponding to the classes of the animal kingdom; thus, smallest in the Mammalia, next in Birds, next in Reptiles, next in Fishes, and largest in the Batrachians. Among the Mammalia, we do not, however, find the smallest in man, but in the Ruminantia, while the Bimana and Quadrumana differ but little from the Rodentia. Examining further, we find that although the size of the body has nothing to do with that of the blood-cells, yet the smallest animals are, in general, the most active; that rapidity of motion is intimately connected with frequency of respiration, and that in animals constituted according to the same fundamental plan, the tendency of nature is to render the blood-cells smaller in proportion as the necessity for respiration increases. This is illustrated in the deer (particularly the musk deer), the stag, and the antelope, who are among the fleetest of animals, and are consequently obliged to breathe frequently, and in them we find the smallest blood-cells.

III. The microscope reveals a dark spot in these minute bodies, which, in the Mammalia, seems to be caused by a central depression, while in the lower animals it indicates the presence of a solid nucleus, and this nucleus may be considered as a sign of physiological inferiority.

In those viviparous animals (camel, etc.) which present the anomaly of elliptical globules, these are found to be destitute of a nucleus; hence the characteristic distinguishing viviparous from oviparous animals seems to be the absence of the nucleus, rather than the circular form.

Again, the structure of the peripheral portions of the red cells, is a question yet to be determined; some suppose them to be enclosed by a kind of membrane, thus forming isolated cells, while others consider them mere masses of gelatine-like substance; there is, however, a strong leaning to the opinion that they consist of a membranous wall (which must be perfectly transparent, since it is the contents within which lend the blood its color), and a gelatine-like substance, rather than a liquid, between the wall and the nucleus. The nuclei are composed of nucleoli. The origin of the red blood-cells is unknown.

WHITE BLOOD-CELLS.

Besides the red blood-cells there are also white blood-cells, and these, unlike the former, are found both in Vertebrates and in Invertebrates. It is believed they originate in the spleen, liver, and other glandular organs of the body. Of these cells there are at least two kinds, and some physiologists think to have discerned four; their nature is not well known, and the solution of the problem depends on the test of chemical reagents as well as upon the microscope. Their number is less than that of the red blood-cells, being in the ratio of one of the former to three or four hundred of the latter.

One kind, which may be called elementary globules, are much smaller than the red globules in man; they appear to consist of a fatty substance surrounded by a layer of albumen; they abound in the blood soon after eating.

Another kind, sometimes called plasmic globules, are larger than the red blood-cells in man; they vary in structure, and are less abundant than the elementary globules.

One thing remarkable in them is the changes of form which they are seen to undergo when observed under the microscope; the motion thus produced resembles the movements of an animal, and hence it has been suggested that they are really animalcules, a theory, however, not accepted by physiologists in general.

In some diseased states of the system the blood exhibits the phenomenon of abnormal blood-cells also.

The blood-cells grow and become modified with age; they are the seat of physiological phenomena, and are endowed with a special activity. We know that the secretory organs of the body—liver, salivary glands, etc.—perform their functions by means of cells, that is, that the secretion of the bile in the liver, of the saliva in the salivary glands, takes place within the cells of these organs; the cells of the blood appear to be of the same nature, differing only by being left to float freely in a fluid instead of being united so as to form layers, tubes, or compact masses, and thus we may look upon them not as simple concretions of animal matter, the result of precipitation or coagulation, but as miniature elementary organisms; and hence the blood may be considered as a living fluid, as liquid flesh.

L.

RUTS.

An order of exercises is considered an indispensable part of the teacher's belongings; we carve up our time into pieces of various lengths, which we endeavor to adapt to the varied wants and requirements of reading, arithmetic, spelling, music, and all the thousand and one tasks which the busy teacher finds to do. After having appropriated every second of breathing time, we make ourselves and our pupils miserable by endeavoring to carry out our programme with the most rigid exactitude. While every nerve is strained to its work, we go over the same old rigmarole day after day, week after week, beating ceaselessly at the same old tasks, at precisely the same time of the day, until we find that our pupils are yawning over their books, and that we are not accomplishing half as much as we expected when we made out that wonderful order of exercises, in which not a moment was wasted.

When we discover that we are teaching in a rut, and feel sure that something must be done to get out of it, what do we do?

Some do not realize what the trouble is; find their scholars sleepy, and know no better way of waking them up than by using the rattan very freely; it wakes them up, perhaps, but whether it makes better scholars of them, is a question open to considerable discussion. When the rattan is used as a cure for laziness, I imagine that its work is rarely crowned with success. Of continual scolding, though there is a strong temptation to it, I have still less an opinion: since it wears out the strength of the teacher, and rather amuses the scholars than otherwise. They are the wisest, I think, who look the matter over, and change their programmes.

It is a good plan, endorsed by many good teachers, to turn the programme upside down, as it were; that is, have that study or recitation first which we are in the habit of having last, and so on. Those who have never tried this simple expedient, will be astonished to see what an effect it has on a sleepy and uninterested class of children; they weary of the old things which they do not know or understand, but have nevertheless grown very tired of; and if the studies are taken up in the morning light instead of the afternoon, they seem much clearer

to their young eyes, and get a little of the gloss of newness on them besides.

But more fatal by far than the unvarying time, is the monotonous *manner* of teaching, into which we fall the more naturally, because our nerves are strained to the utmost tension and we are sorely tried, and it *is* much easier to teach in a rut, than out of one. In the days, now gone by, in which no small amount of time and attention was given to oral instruction, the object lessons, which might have been a means of exciting considerable interest among the scholars, were taught by two thirds of our teachers in a way which would have excited derision and scorn in any well conducted kinder-garten. Not but what we knew that the object should be at hand in giving the lesson, and passed around the class; that the children themselves should be allowed to do some of the talking, and that some small infractions of discipline might be overlooked; that, in spite of blunders, and the silly speeches in which some children delight, and the slow progress made in the search after information, knowledge drawn out was and is worth five times as much as that poured in; although we knew this quite well, we were perhaps tired; the object was not at hand, and the time could not always be spared from other lessons; patience had been sadly worn upon during the day, and we rarely felt like overlooking anything in the way of naughtiness; and it *was* easier to put the lesson, or rather, the skeleton of what the lesson ought to have been, on the blackboard, and say, "Copy it, and then study it." It did just about as well when they were examined, and if it was rather "rutty" it saved a great deal of work. With little children the plan was the same in effect, if a little different in method. "Now, children, put your hands behind you, and listen to every word I say; pay attention all the time, and don't forget anything." This was, of course, quite sufficient to make the lesson totally useless, but the teacher was unconscious of the fact, and went on: "Say this after me; 'The parts of a pin are: head, shank, and point.' Say it three times. Johnny, what are the parts of a pin?" And so on, till oral instruction, which might have been so profitable, became a perfect bore to scholars and teachers, until it was dropped at last from the course of study, to the infinite delight of both.

Another study, if study it could be called, which was always laughed at, and generally neglected, was called morals and manners. Morals was understood by most teachers to mean, learning ten maxims, as well understood by the children as though they were Greek instead of English; and manners were taught by means of memorizing three rules for good behavior. This was all very well, but calling it morals and manners was unmitigated nonsense. Some teachers, while they would be the first to discountenance cheating, lying, and stealing, or rudeness of any kind, maintain that morals and manners can be inculcated, but *not* taught; it is certainly something in which children should not be examined. If we could talk to our pretty, well dressed, well cared for little girls in such a way as to make them more considerate for those who have been less fortunate in their surroundings, we should do an amount of moral teaching more effective than five hundred maxims.

Because Biddy Mack does not belong to her set; because she wears calico dresses without any starch, and dreadful calfskin boots; because she picks up chips in a big basket, and buys flour at the corner grocery by the ten cents' worth, and stays at home on Mondays to help her mother wash, little Miss Elegance never notices her unless when questions in the tables are being passed around, when Biddy is found to be handy, if her hair *is* up, and her stockings are down.

Over the schoolroom door should be written in letters of gold, Marian Douglas' line, "'Tis only good children the angels call fair."

If the teacher by many efforts could but make the little lady understand that those Mondays on which Biddy's seat is vacant are very long to the little girl, no bigger than herself; that she has to rub out the stocking feet; (so many pairs of little stock ings!) and wash the towels through the first water, and tend the baby, and run errands, and help get dinner, and empty the tubs; that the work is not easy, and the arms very small. That there is a big wolf who has been watching their door for many months and years, and that he sometimes comes so close that the wretched mother and the trembling little children can hear his hoarse growl; that he is so fierce and so determined to have his prey, that even the *little* shoulders must be braced to the

wheel whose turning brings them bread, and the little hands must do what they can to beat him away for a while longer. Tell her that the name of the wolf is Poverty, and we hope she may never meet him at her threshhold.

Then Mary Malone, who sits next to her, has such big, coarse hands, and *such* red hair; Miss Elegance "can't endure her," and doesn't scruple to show it. How well might her teacher point to the golden letters over the door, and tell her that angels look past the face and see only the soul; and that she wouldn't wonder if they smiled on poor red-handed, red-headed, red-eyed Mary, while they looked on her with very doubtful eyes. The teacher could whisper to her that the redness of Mary's eyes is caused by tears; that when she thinks of the mother (beautiful to her, because she *was* her mother), whom she had, and has not; her childish heart aches with a bitter pain the little lady's has never dreamed of, and the carrotty head turns from the pillow, and the slip is wet with her tears, night after night. Such moral teaching might fail, but it might have its effect; at least one shell of selfishness might drop away from the wofully selfish little heart; moral *teaching* worthy the name it would be, certainly.

Since the introduction of the Grube system, much "ruttiness" in the teaching of tables has been done away with. Children used to have a peculiar way of "sing-songing" the tables, in which they took an immense amount of satisfaction; if the teacher did not chance to be nervous it was rather soothing than otherwise, and it kept the children out of mischief, but it never taught the difference between one and three, nor the sum of two and two. It was a dreadful rut, but the educational machine seems to be lifted out of it now. The system substituted for it, though much more wearing on the teacher, is so clear, so rational, so interesting to the children, so lasting in what it teaches, that we all owe our thanks to the originator, who evidently is not a man who believes in an unvarying programme, which does not waste a moment, and provides for everything but breathing-time. C. G. D.

[*From The Garden.*]

PREPARING SKELETON LEAVES.

By JAMES F. ROBINSON.

We have recently heard much about finding suitable employment for ladies, and allowing them to enter the medical profession, etc. I leave these discussions to abler minds; and, in a more humble manner, I shall endeavor to point out a little congenial employment for the leisure hours of our fair readers; one, moreover, in which, whilst they are usefully occupied, they will derive both amusement and pleasure. Most amusing scientific work is simply adapted for the passing hour; but mine, if enthusiastically followed, will bring joy when glanced at in years to come, for "A thing of beauty is a joy forever" in more senses than one. A very pleasant occupation for leisure moments is the art of preparing, or rather skeletonizing leaves. The old method, as most of my readers are aware, was simply to immerse the leaves beneath water for several weeks until the epidermis and parenchyma had decayed; then, taking them out, to rub off the decayed fleshy or cellular matter in a bowl of clean water. To say the least of this method, it was very unsatisfactory and often yielded results far from pleasing, without taking into consideration the great amount of patience needful to complete the process. Now, thanks to chemistry, we have another better plan, not occupying as many hours as the old decaying method took weeks to accomplish. An excellent recommendation for processes of this kind is their simplicity, as anything complicated, or requiring expensive requisites in its performance, is sure to be scouted, or, at most, to gain but few adherents. Most of my lady friends to whom I have recommended the undermentioned process for skeletonizing leaves, have fallen so much in love with it, as to follow it up constantly in Autumn, merely for amusement. The result has been the production of many an elegant drawing-room ornament, either being placed in a vase or mounted for framing beneath glass, as a permanent record of their industry. First dissolve four ounces of common washing-soda in a quart of boiling water, then add two ounces of slaked quick-lime, and boil for about fifteen minutes. Allow this solution to cool; afterwards pour off all the clear liquor into a clean saucepan. When the solution is at the boil-

ing point, place the leaves carefully in the pan, and boil the whole together for an hour. Boiling water ought to be added occasionally, but sufficient only to replace that lost by evaporation. The epidermis and parenchyma of some leaves will more readily separate than in others. A good test is to try the leaves after they have been gently simmering (boiling) for about an hour, and, if the cellular matter does not easily rub off betwixt the finger and thumb beneath cold water, boil them again for a short time. When the fleshy matter is found to be sufficiently softened, rub them separately, but very gently, beneath cold water until the perfect skeleton is exposed. The skeletons at first are of a dirty white color; to make them pure white, and therefore more beautiful, all that is necessary is to bleach them in a weak solution of chloride of lime. I have found the best solution is a large teaspoonful of chloride of lime to a quart of water; if a few drops of vinegar be added to the bleaching solution, it is all the better, for then the free chlorine is liberated. Do not allow them to remain too long in the bleaching liquor, or they will become very brittle, and cannot afterwards be handled without injury. About fifteen minutes is sufficient to make them white and clean-looking. After the specimens are bleached, dry them in white blotting-paper beneath a gentle pressure. Of course in this, as in other things, a little practice is needful to secure perfection. Simple leaves are the best for beginners to experiment upon: Vine, Poplar, Beech, and Ivy leaves make excellent skeletons. Care must be exercised in the selection of leaves, as well as the period of the year, and the state of the atmosphere, when the specimens are collected, otherwise failure will be the result. The best months to gather the specimens are July to September. Never collect specimens in damp weather, and none but perfectly matured leaves ought to be gathered.

ESSAY ON FORM, AS A BRANCH OE EDUCATION.

BY PROF. CONRAD DIEHL, ST. LOUIS, MO.

INTRODUCTION.

Only knowledge of form enables mankind to transform raw material to its use. The culture of a people can be measured

by the standard of its utilitarian and æsthetic productions in form. The study of *form* must therefore be considered as one of the most essential branches of public education. It is but too true that in the pursuit of this study no satisfactory results have hitherto been attained in our schools. Whether it is owing to a lack of recognition of the value of this study, or to the absence of a rational method, or both, forms the subject of this address.

Before I can attempt to develop my views, I beg leave to lay before you a series of questions which are of the greatest importance in the consideration of this subject; questions which I have repeatedly revolved in my mind since I have become identified with Art-education in St. Louis.

1. What are the best subjects for study, and in what manner are they to be presented to the pupil?

2. What technical means are to be employed in working out these subjects?

3. In order that a child may learn to comprehend fully the nature of a straight line, should the teacher illustrate such a line on the blackboard *without* the use of a ruler, and should the child likewise be refused the use of the ruler, when drawing straight lines?

4. Should a teacher, in describing a circle, or a section of a circle, or in dividing a line into a given number of equal parts, perform this task without the use of dividers? and should the pupils be likewise required to accomplish it without the aid of such an instrument?

5. Should a class engaged in constructive or imitative work, be refused the use of the ruler and of the dividers, where success in the execution can be tested and governed only by means of these instruments?

6. Would not the demonstration and illustration of geometrical plane figures and of geometrical solids be materially aided by the use of things of daily use which exhibit these figures, and are familiar to the child, while the abstract figures of geometry are new to it, and therefore bewildering? This, it appears to me, is a very important point, as it embodies the first principle of object-teaching, namely: that we must proceed from the known to the unknown.

7. Can receding surfaces be illustrated to a child from drawings on the flat?

8. Should free-hand drawing be practiced in any case but that in which the use of instruments is impossible, as in drawing from real objects, or in sketching?

9. Should not the child, in drawing from real objects, be made familiar with the use of the plumb-line for gauging points within an object, lying in a vertical direction? and also with the process of comparative measurement by means of which the proportions which an object presents in its relations to the eye are compared as thrown upon a plane?

10. Can a teacher present clearly to a pupil a subject with which he or she is not thoroughly acquainted? and, if the study of form and its conditions is to be made a subject of public education, is it possible that such subject can be successfully pursued, unless the opportunity is offered to teachers by Boards of Education to become thoroughly competent and conversant with that which they are to present to children?

11. After teachers have become thoroughly conversant with the phenomena of form and its construction, should they not be supplied with a complete set of models, so constructed as to be separable into their component parts, and into pieces showing the various sections? and should not these models be accompanied by charts upon which these parts are illustrated, in ground plan, elevation and sections, on the scale of the models, together with their constructions according to the rules of perspective, showing the precise appearance of the models in a given relation to the eye?

12. Would not the introduction of an apparatus in which the principles of perspective are embodied, materially aid this study?

PART I.

Of all matters important to the culture as well as the material welfare of a people, not one has been more superficially dealt with in educational systems than the training of the intellect in regard to an understanding of the nature of form. Few among the masses are able to use it as a means of communication, and it is no venture to assert that ninety-nine per cent. are incapable of giving a description of objects by any other means

than words (although before they could designate an object with a word, their eyes had made them familiar with such object), simply because they had never been taught how to see. Yet make this last assertion, and you are either denounced as a maniac, or as an overbearing pretender. You will readily be convinced that those persons can recognize an object at as great a distance as you can; furthermore, that they make distinctions between long and round heads; crooked, snub, aquiline, or other noses, etc.; in short, that they can enter into a verbal description in detail of anything which, by means of vision, they had ever committed to memory; and no doubt, at the moment of description, the object described stands vividly before their mind's eye; but stop them short, avert your face, ask simply which of the two eyelids overlaps the other, the upper or the lower, and you will, nine times out of ten, receive an answer to the effect that they have never examined, despite the fact that there is not a feature which they have more closely scrutinized, and that the eye has been the means of conveying to them all visible impressions. They have failed to examine, simply because they have never been taught how to see. The impression is prevalent among the masses that access to the domain of form is restricted to a few persons of talent, who are particularly endowed by Providence. The existence of this delusion cannot astonish us, since form, that manifestation of matter most easily recognized by the senses of sight and touch, has not yet been subjected to a definite system of investigation and analysis. In connection with this, it may be well to state, that the practical result produced in Schools of Art tends to prove. that the talent most promising on entering does not invariably carry away the palm in the end; but that, on the contrary, those who arrive at the highest distinction gave but indifferent promise at first. These concentrated their force on the training of the mind, in consequence of which their power of execution lagged behind their mental accomplishment; they worked with modest assiduity, and after they had chosen a worthy subject, overcame all technical obstacles, regardless of sacrifices; whilst many of the most promising talents, transported by momentary success, thought that it did not require great exertions on their part to excel, numbered

themselves among the chosen, until it was too late to mend. Thus popular prejudice has been the ruin of many talents who, with earnest application and perseverance, might have become shining lights in their profession.

Form presents three separate fields for investigation :

1. The analysis of that which exists, *i. e.*, learning *how to see.*

2. The digestion of that which exists, by separating and combining the same, *i. e.*, learning *how to think.*

3. The embodiment of our thoughts in form, *i. e.*, learning *how to create.*

When we contemplate a work of art, in sculpture, architecture or painting, we do not realize that these, together with all results produced by the trades, are deduced from one common source. We may readily assert that a chemist can become a successful soap manufacturer, or an artist a joiner or shoemaker, while it would be venturesome to infer the contrary : we readily conclude, that the more a soapmaker knows about chemistry, or a joiner or shoemaker about form, the greater will be his success in his vocation.

The question forces itself upon us, whether the elements of the study of form might not be introduced in the primary classes of our schools as advantageously as Natural Sciences, a question which I answer in the affirmative. I feel confidence in this assertion, because in the first steps taken in the training of the mind, forms are used ; the children are made familiar with arbitrary signs designed to represent sounds, *i. e.*, with letters. Form is next brought into direct requisition by accompanying combinations of these signs, *i. e.* words, with illustrations of the objects they designate, to aid the memory in retaining these words; then, in training the mechanical capacity, the child is taught to imitate those signs, *i. e.*, to write; they thus actually receive the first lessons in free-hand drawing, learning to draw straight lines and curves, and to combine these lines in certain relations and proportions. Beyond this, their imitative capacity in the actual writing of form receives no training, and why? Who will hesitate to declare that, just as a reading lesson is aided by accompanying words with illustrations, a training in the writing of real form, *i. e.*, in drawing from real objects, would materially aid the reading lesson? In the study

of form it may be deemed equally essential that the child should contemplate the best and most beautiful, according to the capacity of its understanding; as in language it is considered necessary that the precepts of the teacher should be unexceptionable, and his or her language simple and correct. It will be found in form, as in language, that the progress made by the child is not limited to the training in school; since, before it entered, it had already exercised the eye, as well as, to a certain degree, acquired the use of language. What it gains in school is practically developed outside by intercourse.

Can we reasonably claim that the eye of a child, up to the time it enters a school, has been less active than its tongue or ear, when we positively know, that it learns to identify words with objects and sensations long after it is familiar with such objects and sensations? Do we not frequently find children making attempts to draw objects before they have the faintest idea of word-writing? Is not writing in form a transmutation of ideas into the universal language? And could any teacher conversant only with the language of his nation, read books written in foreign languages, whether French, German, Spanish, Russian, Arabic, Chinese, etc., as readily as a man or woman properly trained in the reading and writing of form would read their designs, or even a child their picture books designed expressly for children? Are we not entitled to anticipate as decided results by encouraging a child to imitate form, as we attain in language, by systematic training? The great end which we attain in reading, is to learn to understand that which has been written by others; in writing and speaking, to communicate our thoughts to others; in drawing, to embody ideas in form. What we know or see, we can communicate by these means; there are, however, many things which we can communicate in writing and not in drawing, and *vice versa*.

Before proposing a new plan for instruction in drawing, it is necessary to give sufficient reason for condemning the system hitherto in use, *i. e.*, drawing from cards.

All elementary drawing-cards commend themselves to the eye as being well adapted to the purpose of teaching juveniles how to draw, inasmuch as they offer precisely such representations as the child would attempt in drawing from the objects

themselves, *i. e.*, outlines. Such patterns teach a child to ignore the fact that objects are bounded by planes, and can be represented from more than one point of view. Now, instead of setting a child to copying such meaningless things, why not place it under the guidance of a person who can direct it to draw the outlines of the various sides of an object, that it may learn to understand the value of surfaces in various positions?

Let children, from the start, be impressed with the true condition of things, and if a child is considered too young to be benefited by a consistent proposition, let us not pervert its judgment by trying to accommodate the matter to its understanding in a manner which is ever subject to contradiction; but let us wait until the child is prepared. Then, instead of teaching it to identify outline and shading with form, let them understand that what is technically described by an outline, is the boundary of an object, conditioned by its surfaces escaping the angle of vision; and that what is called shading, is the gradation of light on the convex surfaces of the object, in their relation to the source of light; furthermore, that the side opposite to that which receives the direct light is also illuminated, only in less degree, by reflection.

How can a receding surface be made clear to a child from a drawing card? If it is merely the object to train a child to perseverance in aimless work, nothing can be better calculated to produce this effect than drawing cards, although the same end might be attained by suffering it to stare at a point on the wall for hours at a time. By placing a child before a natural object, we at once call its reasoning faculties into activity; by placing it before a card, we leave these faculties in repose, and its eye patiently glides from one surface to another. The shading system in card drawing is a rare invention; one method proposes to produce the effect of shadow by lines drawn thicker or thinner, closer together or wider apart; another, by crossing lines, etc., whilst in nature nothing of all this trumpery can be found.

Why should objects, whose surfaces are represented smooth in the light, be represented crossed in the shadow? The photograph will offer the best guide for technical means in that direction. Technical restrictions will only force themselves upon those who work on materials which will not admit of a free treatment, as wood, steel, stone, etc. Shading is a perverted term; nature gives us no means for identifying it. Modeling is the word for which it has been substituted. In card drawing, the term shading is used as the end of modeling, while in truth shading is but the means to this end. Light may be thrown upon an object from as many sides as possible, and in

such manner that not one of its surfaces will be in shadow, yet the object will show its relief and can be reproduced on canvas, conveying fully the same idea of relief as though it were exposed to but one source of light. The vocabulary of a card-drawing teacher is soon exhausted; "too long, too short; too broad, too narrow, too thick, too thin; too heavy, too light; and, in the wrong direction."

It is clear that a teacher can only successfully teach that which he knows himself; and if a drawing-teacher teaches from cards, it is ample proof that he has not the capacity to teach drawing from objects; for if he had, he would never stultify himself by the use of a method so irrational. The aim, from the beginning, should be to teach a child to see and to understand form in all its conditions and relations, regardless of the technical result produced at first; since in the technical acquirements in this, as in all other pursuits, practice makes perfect. The summing up of all amounts to the following: whoever is capable of producing good results in drawing or painting from nature, will find no manner of difficulty in copying a drawing or a painting, whilst the reverse is entirely out of question. A man who can produce, can surely copy his own product.

Part II.

First Lessons in Drawing.—The first lesson in drawing should be an object lesson, and in giving this lesson three points must be considered: first, to train the eye; second, to exercise the hand; third, to cultivate the understanding.

In looking at an object, the first impression the eye receives is its general boundary; next, the eye wanders within that boundary to examine the minutest features. The only technical means for describing these boundaries, and also for determining the parts within, is the *line*, and with this means the child should be directed to describe the impressions received upon a plane surface, be it upon a slate or paper. The child will make an attempt, and it will be at once perceived that the eye will neither be able to recognize the true direction of a line, nor will the slate- or lead-pencil submit to be guided in a desired direction; and that, in consequence, the attempt proves a failure. This is the most opportune occasion to act upon the child's understanding. The child is perplexed and its interest excited, therefore a great effort must be made on the part of the teacher to leave an impression on the mind which the child can realize, and one which will never be subject to a contradiction during the entire course of the study of form. Unless this point is made, it is a question whether the mind of a child will *ever* be so readily accessible to a subsequent new proposition.

The most striking and valuable disclosure that can be made to a child, is to illustrate the rule: "How to construct one

straight line, at right angles to another;" and in order to present this rule in its most valuable form, the direction of the first line given should be horizontal, in consequence of which, the line constructed at right angles must needs be vertical. After the illustration is concluded upon the board, if the teacher holds a plumb-line over the vertical chalk mark, and a cup brim full of water under the horizontal line, the impression made on the mind of the child can never be effaced from its memory as long as it is possessed of reason. This, then, has restored the confidence of the child, that had been shaken in its first attempt in the new study, and if this success is properly followed up, it cannot otherwise than create a strong desire to hear the next proposition.

The teacher can now illustrate with objects of industrial production how almost every object of use is constructed upon this basis; the chair, the table, the bureau, the washstand, the glass, the bowl, the castors, and every part belonging thereto; the houses, doors and windows, etc., *ad infinitum*. Also, it will be realized that all animated nature is constructed upon the same basis; that in the human being, in an upright position, equally supported on both feet, the central line is vertical, whilst the complementary features of either half (externally) invariably lie in a horizontal direction; and so throughout the animal kingdom. How much consciousness has thus been gained by little! and to what extent will not this simple lesson lead, in directing the child's observations!

We have now advanced to a point at which it is necessary to give the child some assurance of its ability to acquire skill in a mechanical direction; that it may, with proper application and care, learn to perform certain things as well as they can be performed; and the teacher will henceforth divide his lessons into two kinds, viz: object lessons, and exercises in construction.

OBJECT LESSONS.—It is evident that in the investigation of natural objects, with a view of reproducing the impression received, on a plane surface, no mechanical instruments can be called to aid, except the plumb-line and the straight-edge (pencil). The one, to determine points within an object, falling in a vertical direction, the use of which can be easily acquired; the other, to determine points lying in a horizontal direction, by holding up a pencil. When the head is erect, the pupils of the eyes lie horizontally, and with some practice the direction desired can be gauged.

It is valuable for teachers to know, that children will never, at first, attempt to describe an object as they see it, but as they know it to be. In an effort to delineate a human head, the child may be found to reason somewhat as follows: "A head is round, it has two eyes and one mouth that lie flat, one nose and

two ears that 'stick out.'" These conclusions are forthwith illustrated; and, to its utter astonishment, after having located the eyes and the mouth within the circumference, the nose projecting from one side of the curve and an ear from the opposite side, there remains no room for the second ear. The child perceives that something is wrong, and is puzzled to find the reason; it recapitulates, but that only increases the mystery. This peculiarity can best be observed in a class of children placed before a cast of a human hand or head. It will be found in the first attempt made to reproduce such objects on paper, that, if it be a hand, the child will draw four fingers and a thumb, regardless of whether all of the fingers, or the thumb, are visible from its point of view or not; and it will not realize that if a finger is foreshortened, the impression received is different from one presenting its full length to the eye. The child will, with full confidence, draw four fingers and a thumb, and if the thumb and little finger turn out smaller than the other fingers, the author may be considered a prodigy. Again, if a face present a three-quarter view, equal justice will be done to the eye on the off side of the face, which is partly shut out from view by the projection of the nose, as to the eye which presents itself fully to view; and this because the child *knows* that the off eye is not a whit smaller than the other. It is here necessary that the teacher should describe the form of the object in question on paper, and invite the child to follow the movements of his pencil with the eye and compare the lines with the original forms.

It is of great importance that the child should be made thoroughly acquainted with the nature of the task, and nothing can be attained more easily.

The impression which the eye receives of an object is to be portrayed upon a plane surface. The object being a solid, and in consequence being capable of representation from an indefinite number of points of view, it is necessary that the conditions governing the picture which the eye received of the object, in its relative position, should be clearly demonstrated. To accomplish this end, two things are necessary: first, that during the time occupied by actual illustration, the object remain in a fixed position; second, that the child retain the position first assigned to it, during the entire proceedings. The teacher will produce a pane of glass upon which equal squares are described, and hold it touching the nearest point on the surface of the object, at right angles to the line of vision (of the pupils), beginning at one extreme side of the object. All children sitting on the corresponding side of the room will now find the boundary, as well as the features, inscribed into the squares, and the picture thus received into the surface of the glass reveals precisely the manner of producing its appearance, from a given

point of view, on the plane surfaee; and if this pane of glass is made stationary, and an equal number of squares is deseribed upon the paper or slate to those on the glass through whieh the pieture of the object is transmitted, the ehild realizes the phenomena readily by tracing the lines within the squares, even though at first the results may not prove satisfaetory. This method of investigation will, owing to its simplicity, eonsisteney and truth, so strongly impress the mind, that the substance of the illustrations will remain indelible. Thus the ehild has received the most important notions of the phenomena of form.

Lessons in Construction.—These lessons are not less important for the edueation of the eye and the development of the understanding in the study of form, than objeet lessons, and the same amount of time should be devoted to each. The first exereise will be to teach a ehild to draw and recognize straight and regularly curved lines. One of the first examples of construetion involves both: how to eonstruct a right angle. Before a ehild ean fully reeognize a right angle, it ean gain but an imperfeet comprehension of an aeute or obtuse angle, sinee the former is the measure of the latter.

It will be eonsidered but reasonable, if the task to draw straight lines and regular curves is assigned, to allow the pupils the use of the straight edge and the eompasses as indispensable. What artist, teehnieally ever so skillful, would volunteer to draw a straight line or a eirele without the aid of these instruments, free-hand, in eompetition with a boy or girl thirteen years of age, properly trained to their use, and allowed to use them? And what ean offer more satisfaction to a ehild, than the assuranee that, with these instruments, it ean draw eertain lines as aeeurately as an artist? The possession of these instruments offers an emolument, and the ehild will make strong efforts to master their use, and will soon be prepared to eonstruet all regular plane figures, from the triangle to the ellypse.

Engaging Manners.—There are a thousand engaging ways, whieh every person may put on, without the risk of being deemed either affeeted or foppish. The sweet smile, the quiet, eordial bow, the earnest movement, in addressing a friend, or more espeeially a stranger, who may be reeommended to us, the graeeful attention whieh is eaptivating when united with self-possession; these will insure us the good regards of all. There is a eertain softness of manner whieh should be eultivated, and whieh, in either man or woman, adds a eharm that is even more irresistible than beauty.

DEPARTMENT OF PUBLIC INSTRUCTION.

ON ENTERING upon his official duties, the State Superintendent appointed a State Board of Examination, composed of teachers, who are residents of San Francisco. The business of the Board was transacted very efficiently until the State Superintendent's office was removed to Sacramento. Then the meetings became very irregular, and vexatious delays occurred in the dispatch of business. The State Superintendent saw himself, therefore, compelled to reorganize the Board by appointing four teachers who are residents of Sacramento. Accordingly, on the 1st of October, 1873, a new Board was appointed, consisting of A. H. McDonald, J. H. Eickhoff, Miss M. J. Watson, and Miss Annie P. Weeks. The State Superintendent is *ex-officio* Chairman, and J. H. Eickhoff was elected Secretary. All applications for State certificates or diplomas must be sent to the State Superintendent's office at Sacramento.

SEVERAL County Superintendents seem to hold that if from any reason whatever an election for Trustees is illegal, they, as County Superintendents, have the power to determine the legality of the election, and to set aside such election, and to appoint Trustees in place of those elected by the people. Now, a County Superintendent is only an executive officer, and no executive officer, not even the Governor of the State, has the power to determine the legality of an election, or to set aside an election. An executive officer can only appoint to an office in cases and under circumstances specified by law. A County Superintendent can appoint a Trustee *only* when the people fail to elect, or when a Trustee neglects to qualify within a certain time, or when a Trustee resigns. The question of the legality of an election can only be decided by the County Court, in the manner prescribed by law.

SEVERAL County Superintendents have asked whether they have the power to remove a Board of Trustees upon a petition from the majority of the parents or voters of a district? Certainly *not*. This will be sufficient answer. To go into the details of the question, at this late date, would be an insult to the general intelligence of school officers.

THE question has been asked whether a Board of Trustees can maintain more than one school at the same time. We think the question refers to a case where a Board of Trustees maintains separate schools in different parts of the district. We see nothing wrong in this; on the contrary, we hold it is the plain duty of the Trustees to establish as many schools, and in as many places, as the needs of the district may demand.

A DISTRICT, organized some years ago, selected a site for a school-house, but erected no building thereon. Since then the boundaries of the district have been so changed that the present site is no longer centrally located. The question is asked whether the site may be changed on petition, or whether it must be changed by a vote of the district. If there is any contest in the matter, or if the new site must be purchased, the district must certainly vote upon the question; but if the new site is donated, and its location is unobjectionable to the patrons of the school, the Trustees may act upon the question in accordance with the prayer of a petition.

THE same district, having maintained no public school for several years, has received for those years no public school moneys. Last year, however, a three months' public school was maintained, and the district asks whether it is not entitled to its share of the public school moneys for the present year. Undoubtedly yes; for the default of maintaining a tree months' school during any year entails a forfeiture of only the next year's portion of the school funds.

COUNTY SUPERINTENDENTS,

ELECTED SEPTEMBER 3D, 1873, AND THEIR POST OFFICES.

COUNTIES.	Names.	Post Office.
Alameda	Rev. W. F. B. Lynch	East Oakland
Alpine	A. C. Pratt	Monitor
Amador	Rev. S. G. Briggs	Jackson
Butte	H. T. Batchelder	Oroville
Calaveras	J. B. Garvey	Angels
Contra Costa	A. Thurber	Pacheco
Colusa	J. E. Putnam	Colusa
Del Norte	Max Lippowitz	Crescent City
El Dorado	Jno. Munson	Placerville
Fresno	Rev. T. O. Ellis, Sr.	King's River
Humboldt	E. C. Cummings	Ferndale
Inyo	Geo. H. Hardy	Independence
Kern	L. A. Beardsley	Bakersfield.
Klamath	S. L. Finley	Sawyer's Bar
Lake	Louis Wallace	Middletown
Lassen	Z. N. Spalding	Susanville
Los Angeles	Geo. H. Peck	El Monte
Marin	Saml. Saunders	San Rafael
Mariposa	David Egenhoff	Mariposa
Mendocino	J. H. Seawell	Ukiah City
Merced	B. F. Fowler	Snelling
Mono	E. R. Miner	Benton
Monterey	R. C. McCroskey	Salinas City
Napa	Rev. G. W. Ford	Napa
Nevada	Frank Power	North San Juan
Placer	John T. Kinkade	Auburn
Plumas	W. S. Church	Quincy
Sacramento	Dr. G. R. Kelly	Sacramento
San Bernardino	Henry Goodcell, Jr.	San Bernardino
San Diego	J. H. S. Jamison	North San Diego
San Francisco	James Denman	San Francisco
San Joaquin	T. O. Crawford	Stockton
San Luis Obispo	Jas. M. Felts	Cambria
San Mateo	C. G. Warren	Redwood City
Santa Barbara	Rev. J. C. Hamer	Santa Barbara
Santa Clara	J. G. Kennedy	San José
Santa Cruz	W. H. Hohhs	Soquel
Shasta	L. K. Grim	Shasta
Sierra	A. M. Phalin	Port Wine
Siskiyou	Wm. Duenkel	Yreka
Solano	C. W. Childs	Suisun City
Sonoma	A. C. McMeans	Santa Rosa
Stanislaus	James Burney	Modesto
Sutter	M. C. Clark	Yuba City
Tehama	Chas. D. Woodman	Tehama
Trinity	Hiram H. Bragdon	Weaversville
Tulare	R. P. Merrill	Porterville
Tuolumne	John Murnan	Sonora
Ventura	F. S. S. Buckman	San Buenaventura
Yolo	G. N. Freman	Woodland
Yuba	Th. H. Steel	Marysville

STATE NORMAL SCHOOL.

I.—THE OBJECTS AND WANTS OF THE NORMAL SCHOOL.

To the Board of Trustees of the State Normal School of California:

GENTLEMEN:—Your Committee, to whom was referred the matter of "The Objects and Wants of the Normal School," beg leave respectfully to submit the following report:

The primary object of a Normal School is to fit young persons to enter upon the work of teaching intelligently, and to perform the work successfully.

Theoretically, a Normal School should teach only *how* to teach, receiving pupils after they are fully prepared in scholastic attainments, and giving them the necessary instruction in the philosophy of education and methods of teaching.

Practically, it has in all cases, your Committee believe, been found necessary to devote much of the time and labor of the school to preparing pupils in the branches to be taught.

Several causes conspire to make this divergence between the theory and the practice in Normal Schools. Among them are the following:

I. The profession of teaching has, as yet, not become so permanent and remunerative that pupils will take the time, after having acquired sufficient knowledge to obtain certificates, to qualify themselves in methods of teaching, and a school doing only professional work, would find itself without pupils.

II. The successful teacher requires more positive, exhaustive, and definite knowledge of the branches he is to teach than is usually given in other schools.

III. It is believed, and perhaps truly, that there is a certain economy in combining the instruction *how* to teach with that which gives *what* is to be taught.

IV. Most persons who desire to fit themselves for teaching, desire at the same time to acquire the knowledge that will fit them for any or all the duties of life.

Whether all this is founded in good philosophy or not, we are obliged to accept it as true, and schools must, to meet the public demand, be organized and conducted accordingly.

It remains, then, to present the plan which will, under the circumstances, best meet public demand and accomplish the desired end. In connection with this, your Committee make the following suggestions:

The school must be manned by a corps of well qualified instructors. This involves teachers who, in addition to the thorough and critical knowledge of the branches taught, which is absolutely necessary, shall have devoted time, study, and thought enough to the subject of teaching, so that they have arrived at the natural or normal method of presentation, and who are sufficiently acquainted with the laws of menta growth and development to be able to judge whether their work is accomplishing what they desire. They must also have that somewhat rare power of *selection*, which will enable them to distinguish between essentials and non-essentials and to work accordingly.

In addition to this, they must have that mental strength and activity which will enable them, when brought into contact with adult and vigorous minds, to lead them, instead of being led by them.

If such teachers can be found and secured, the success of your school is certain.

A Normal School, from its very nature, must be progressive. No school, and no

teacher in the school, must rest contented upon the laurels already gained, or the point already attained. There is need for constant intercourse with educators the world over. One who would hold and worthily fill his position as a teacher in a Normal School can do so only by a life of labor.

The course of study and training should provide for two distinct kinds of work. That is, there are certain subjects that teachers are required to *know*, and there are other subjects that, under existing circumstances, they can only be expected to know *about*. Could one course of study be extended to three or even four years, we might enlarge the first class of subjects and diminish the second. That, for the present, seems impracticable.

There must, then, be given a thorough, searching, definite knowledge of the branches which are to be taught in the public schools, and a power to express that knowledge with clearness and precision. Nothing can take the place of this. And especially should this knowledge and power be given in the structure and use of our mother tongue. Language is the teacher's instrument; if he would be successful he must become the master of it.

Of the second class of subjects—those upon which we may expect only general information—but a *general* knowledge can be given. This knowledge should be accurate, as far as it goes; should give the boundaries and divisions of the subject, and such other information as will enable the pupil to pursue it alone after leaving the school, and if possible, such a love for study as will give him an inclination so to do.

Many of these so-called higher studies have a very important economic value; that is, they are closely connected with the laws of life and health; with the daily avocations of life, and with the protection and development of the resources of our State. The instruction in these should be such as to bring this relation constantly before the pupil, thus compelling him to realize that our schools should prepare children for the practical duties of life.

As many of these studies require for their proper prosecution illustrative apparatus, the Normal School must have at as early a time as possible a complete apparatus.

Most of the points in reference to the organization of the school having been presented by the Principal and adopted by the Board at its last meeting, your Committee need not here recapitulate them.

All of which is respectfully submitted.

B. CORY,
CHAS. H. ALLEN, } *Committee.*

San José, Oct. 22d, 1873.

II.—PREPARATORY DEPARTMENT.

To the Board of Trustees of the State Normal School of California:

GENTLEMEN:—Your Committee, to whom was referred the matter of "Additional Teachers in the Normal School," "The Opening of a Preparatory Department," and "The Organization of a Past-graduating Course," respectfully report the following:

I. That we recommend the Board to authorize the Committee on Teachers to procure, as soon as they are satisfied that they can secure the proper person, an additional male teacher, at a salary of not to exceed $2,400 per year.

II. That the Principal of the school be authorized to open a Preparatory Department, and, in conjunction with the Committee on Teachers, to employ a Principal for

the same, at a salary of not to exceed $1,200 per annum. That a tuition fee be charged for instruction in this department of not less than $1 per week. That the Committee on Teachers be authorized to establish such rules and regulations for the admission to said department as they see fit, such rules and regulations to be submitted to the Board for their approval.

III. That there be opened, in connection with the last term in the year, a past graduate class, to which may be admitted graduates of this or other Normal Schools, High Schools, Colleges, or Academies, who shall present satisfactory evidence of having taught at least one year successfully. That the instruction in this class be mainly professional, and that to graduate from this class a professional diploma be granted.

All of which is respectfully submittod.

San José, Oct. 22d, 1873.

JAMES DENMAN,
HENRY N. BOLANDER, } *Committee.*
CHAS. H. ALLEN,

The report of the Committee was accepted and each of tho recommendations adopted by the Board.

III.—CIRCULAR.

INSTITUTE TERM.—No provision having been made for a State Teachers' Institute, an Institute Term will be held in connection with the Normal School, beginning Tuesday, January 6th, 1874, and ending Friday, January 23d, 1874. The term is made somewhat shorter than tho session last year, with the hope that more teachers may be present during the entire session. The members of the Institute will receive two hours' instruotion per day from the Faculty of the Normal School and others, upon subjects pertaining to the duties of the school-room, and in addition will have the privilege of attending any of the classes in the Normal School, and of witnessing the instruction in the Model School. Evening lectures will be delivered during the session upon educational topics, by prominent educators. The list of lecturers will be announced hereafter. Board can be had at reasonable rates, and it is expected that the railroad companies may extend the same courtesy that they did last year—free return tickets to those attending the session. County Superintendents are requsted to give notice through tho local papers and in other ways, of the Institute Term, that unemployed teachers may avail themselves of this means of improvement.

PAST GRADUATE COURSE.—The Trustees have also made provision for a past graduate course, open to graduates of this or other Normal Schools, High Schools, Colleges or Academies, who may present satisfactory evidence of having taught successfully for one year. This class will be provided for only during the last term of the year. The instruction will, in the main, bo professional, and to those graduating from this olass a professional diploma will bo granted. The past graduate oourse will afford an opportunity to teachers to review their studies, to become acquainted with the most approved methods of instruction, and by the aid of the apparatus with which the school is soon to be supplied, perhaps to become more familiar with illustrative apparatus and more skillful in its manipulation.

PREPARATORY CLASS.—A preparatory class will hereafter be connected with the

school, where those who are not qualified to enter the school may find means of qualifying themselves, under the supervision of the Normal School. In this a tuition fee will be charged. All other classes are free. For further particulars, address

CHAS. H. ALLEN,

Principal State Normal School, San Jose, Cal.

WE CLIP the following from the Petaluma *Argus:*

Petaluma has an excellent school department. At no time for years has the community been so well satisfied with the administration of school affairs. Perfection has never yet been reached in educational matters, and there is, of course, room for improvement; but we do not believe there is a city in the State of the size of Petaluma, in which the public schools as a whole are superior to ours. The High School fills a want that has long been felt. It is ably conducted and justly popular. It deserves the support and encouragement of the entire community, of whose material as well as educational interests it is and will continue to be a large promoter. The Grammar and Primary departments are in the hands of teachers who, so far as we are able to learn, perform their duty faithfully and give good satisfaction. All the schools are well attended, the number of pupils enrolled last month being 568, which is 23 greater than in the corresponding month last year.

COUNTY Superintendents elect take office on the first Monday in March, 1874, and hold office till the first day of January, 1876.

BOOK NOTICES.

ST. NICHOLAS, FOR NOVEMBER. Published by Scribner & Co., 654 Broadway, New York. $3 00 per annum.

In *Scribner's Monthly* for July, 1873, appeared an article on *Children's Magazines*, which we should like to print in full; but we have room for only an extract or two:

"Sometimes I feel like rushing through the world with two placards—one held aloft in my right hand, BEWARE OF CHILDREN'S MAGAZINES! the other flourished in my left, CHILD'S MAGAZINE WANTED! A good magazine for the little ones was never so much needed, and much harm is done by nearly all that are published. In England, especially, the so-called juvenile publications are precisely what they ought not to be. In Germany, though better, they too often distract sensitive little souls with grotesquerie. Our magazines timidly approach the proper standard in some respects, but fall far short in others. We edit for the approval of fathers and mothers, and endeavor to make the child's monthly a milk-and-water variety of the adult's periodical. But, in fact, the child's magazine needs to be stronger, truer, bolder, more uncompromising than the other. Its cheer must be the cheer of the bird-song, not of condescending, editorial babble. If it *mean* freshness and heartiness, and life and joy, and its words are simply, directly and musically put together, it will trill its own way. We must not help it overmuch. In all except skillful handling of methods, we must be as little children if we would enter this kingdom.

"If now and then the situation have fun in it, if something tumble unexpectedly, if the child-mind is surprised into an electric recognition of comical incongruity, so that there is a reciprocal "ha, ha!" between the printed page and the little reader, well and good. But, for humanity's sake, let there be no editorial grimacing, no tedious vaulting back and forth over the grim railing that encloses halt and lame old jokes long ago turned in there to die.

"Let there be no sermonizing either, no wearisome spinning out of facts, no rattling of the dry bones of history. A child's magazine is its pleasure-ground. Grown people go to their periodicals for relaxation, it is true; but they also go for information, for suggestion, and for to-day's fashion in literature. But with children the case is different. They take up their monthly or weekly because they wish to, and if they

don't like it they throw it down again. Most children of the present civilization attend school. Their little heads are strained and taxed with the day's lessons. They do not want to be hotbered nor amused, nor taught, nor petted. They just want to have their own way over their own magazine. They want to enter the one place where they may come and go as they please, where they are not obliged to mind, or say "yes ma'am," and "yes sir,"—where, in short, they can live a brand-new, free life of their own for a little while, accepting acquaintances as they choose and turning their backs without ceremony upon what does not concern them. Of course they expect to pick up odd bits and treasures, and to now and then "drop in" familiarly at an air-castle, or step over to fairy land. They feel their way, too, very much as we old folk do, toward sweet recognitions of familiar day-dreams, secret goodnesses, and all the glorified classics of the soul. We who have strayed farther from these, thrill even to meet a hint of them in poems and essays. But what delights *us* in Milton, Keats and Tennyson, children often find for themselves in stars, daisies, and such joys and troubles as little ones know. That this comparison holds, is the best we can say of our writers. If they make us reach forth our hands to clutch the star or the good-deed candle-blazo, what more can he done?

"A child's periodical must he pictorially illustrated, of course, and the pictures must have the greatest variety consistent with simplicity, beauty and unity. They should be heartily conceived and well executed; and they must he suggestive, attractive and epigrammatic. If it he only the picture of a cat, it must be so like a cat that it will do its own purring, and not sit, a dead, stuffed thing, requiring the editor to purr for it. One of the sins of this age is editorial drihbling over inane pictures. The time to shake up a dull picture is when it is in the hands of the artist and engraver, and not when it lies, a fact accomplished, before the keen eyes of the little folk. Well enough for the editor to stand ready to answer questions that would naturally he put to the flesh-and-hlood father, mother, or friend standing by. Well enough, too, for the picture to cause a whole tangle of interrogation marks in the child's mind. It need not he elahorate, nor exhaust its theme, but what it attempts to do it must do well, and the editor must not over-help nor hinder. He must give just what the child demands, and to do this successfully is a matter of instinct, without which no man should presume to he a child's editor.

"Douhtless a great deal of instruction and good moral teaching may he inculeated in the pages of a magazine; but it must he hy hints dropped incidentally here and there; hy a few hrisk, hearty statements of the difference hetween right and wrong; a sharp, clean thrust at falsehood, a sunny recognition of truth, a gracious application of politeness, an unwilling glimpse of the odious doings of the uncharitable and hase. In a word, pleasant, hreezy things may linger and turn themselves this way and that. Harsh, cruel facts—if they must come, and sometimes it is important that they should —must mareh forward boldly, say what they have to say, and go. Tho ideal child's magazine, we must remember, is a pleasure-ground where hutterflies flit gayly hither and thither; where flowers quietly spread their hloom; where wind and sunshine play freaks of ligbt and shadow; but where toads bop quickly out of sight and snakes dare not show themselves at all. Wells and fountains there may be in tho grounds, hut water must be drawn from the one in right trim, hright little buckets; and there must he no artificial coloring of the other, nor great show-cards about it, saying, "Behold! a fountain." Let its own flow and sparkle proclaim it."

This article was written hy Mrs. Mary Mapes Dodge, who now appears before us as tho editress of *St. Nicholas;* and its first number realizes in a high degree the author's ideal, as sketched above. Among the thirty-three articles there are some for every eye, from the very little ones to the oldest of young, or old people. A whole page of large type is dovoted to "little children with hig eyes." Bright little jingles and "Jack-in-the-Pulpit," full of wit and wisdom, do some curious sermonizing:

"How did they learn that their ways were small?
Jean and Kitty—
How did they know they were scorned hy all?
Jean and Kitty—
Why, they listened one day, at a neighhor's blinds,
And heard the family speak their minds—
What a pity!

Then there are interesting descriptions of zebras, passenger-pigeons, the curious inhabitants of the Farallone Islands, and the Piute Indians; a charmingly-told account of a fairy's visit to a bee-hive; a funny story of "Andy and the Worm;" a book about dolls, written by a boy, and written as only a boy can write. In short, the reading matter is emphatically varied and bright. The illustrations are the work of well known artists, and are of that superior character which have placed *Scribner's Monthly* in the front rank of American periodical literature.

[The Department of Public Instruction, Educational Items, and many notices of books and periodicals have been unavoidably crowded out of this number.]

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THE

CALIFORNIA TEACHER.

JANUARY, 1874.

VOL. XI. SACRAMENTO. No. 7.

CIRCULATION OF WATERS ON SURFACE OF THE EARTH.

IV.

As frequently several strata containing water lie one above the other,—in digging for coals in St. Nicholas d'Allierment, near Dieppe, seven with considerable ascending force were discovered, the last a thousand feet below the level,—if the upper one does not yield water enough the borer is sent down deeper, though not always with a happy result. It has thus happened thrice in Würtemberg that the water thus obtained disappeared, for instead of a new layer a cavity had been pierced, into which the water disappeared.

As a rule, the water in the stratum thus pierced is stagnant, but sometimes also flowing, in which case the plummet drops suddenly deeper, and begins to swing hither and thither; as in Paris, at the Barriere of Fontainebleau, where it fell twenty-three feet. At the Gare Sain Ouen, of five springs bored, the third had so strong a flow that the stones which the borer had brought up out of the deeper shaft, were carried away; this obviated the necessity of expediting them up to the top opening; they were raised no higher than to the third. How do such subterranean rivers originate? This may be observed in the Carse, in Carniola. There a younger, firmer limestone formation lies on top of another quick-crumbling one. If the substratum is destroyed, the upper sheath falls in. In hundreds of examples, cavities formed in this manner are to be seen on

the line of the railway between Vienna and Trieste. If a river falls into such an opening, it disappears; re-appearing again afterwards at a great distance. Enquiring my way at the nearest post-house to the Perte du Rhone, the official said to me: "You don't need to go there, you can see something much more remarkable in the garden at the back of my house." And indeed the sight was worth looking at. I found myself suddenly at the side of a perpendicular, deep-cut, perfectly dry channel, the rocky bottom of which was perforated like a sponge. Now when the water of the subterranean river rises, it oozes out of these apertures, filling the whole bed. And did not Livingstone see the mighty waterfall of the Zambesi disappear into a deep cleft? Something similar has likewise been observed in plains, as for instance, in the case of the Gaudiana, which for a time is lost in a great measure; so that when the Spaniards are told of the great bridges in England, they answer proudly: "In Estremadura there is one on which a hundred thousand oxen can graze together." Sometimes those subterranean rivers only flow periodically, the explanation of which phenomenon is to be found in Greece.

The South of Europe shares the sub-tropical rains which fall heaviest in autumn, continue throughout the winter on to spring, where they reach a second maximum, while in summer there fall none. In the Morea, a part of these waters flow from the mountain steeps right into the sea; the others collect, forming a lake in the deep ravines of the interior. The side walls of these ravines are cracked and rifted, and form natural drain-pipes to the lakes, which are called Katavothra, when, in the rainy season, the level of the lake rises to, or above the mouth. The issues of these canals are called Kephaloorysi, *i. e.*, river-heads. In this manner the waters of the Lake of Stymphalos form the Erasinas: those of the plain of Argos, at Mantinea, the Anavolo; those of Lake Phenia, the sources of the Ladon. Drama Aly, the last Bey of Corinth, in order to prevent the stopping up of those issues, had an iron grating put over three of them at the Lake of Phenia. At the outbreak of the Greek war of liberty they were removed, and a rich plain was thereby turned into a lake of 150 feet deep and 20,000 of mean breadth. It is almost the same case with the Lake of Copaiva, in Beotia,

between Helieon, Chlomo, and Ptoon. At the end of the summer, in August, this lake was transformed into a plain, with the exeeption of a little pond at Topolia. By here widening the Catavothra, man had aided nature; nay in antiquity, two artificial tributaries had already been eontrived. If these subterranean springs open into the sea, sweet-water springs are originated; as in Anavolo, Artros, and many other points of the rugged coast of Argolis, Laeonia and Achaia. Sueh plaees in the days of antiquity were regarded as saered spots, whenee the ruins of temples are so often to be found in their vieinity. But as a proof of how far those water-tight strata can run out into the sea, an English convoy-ship eame upon a vast sweet-water spring, bubbling up at a distanee of a hundred nautieal miles from the nearest point of the Indian eoast. This ean never oeeur in the shattered primitive rocks, whieh lie everywhere seattered about. Therefore in a granite vale we find many, but only small springs, whieh, hidden away under the stones, betray their presence by their murmuring. What a contrast between such springs and those of the Vaueluse, whieh in one minute, even when their flow is seantiest, yield 1,200 cubie feet of water, and three-fold the quantity at other times.

The springs which originate in glaeiers, form a elass by themselves. They are born of the water melting from the surfaee of the glaeier, penetrate between the rifts, then flow on under the ice, till at last they issue forth, very frequently out of a splendid iee-grotto. The finest instanee of this is the souree of the Ganges, which breaks out as a stream one hundred and twenty feet broad, from a perpendieular wall of iee in the vieinity of the temple of Gangatri. All those glaeier rivulets, known by their white, soapy-looking water, have a fuller flow during the day than at night; and the higher the temperature of the air, the more abundant are their waters. We have one remarkable proof of their flowing under the glaeier iee. In the year 1790, Christian Borer, the landlord of the Grindenwald, tumbled into one of those rifts in the iee, while driving his floek down from Boeniseek. When he eame to himself, he discovered he was lying in flowing water, and began to make the best of his way out again with his broken arm, coming to light at the gate of Dütsehine, having erept for hours through icy flowing water.

The fruitful soil of our lowlands generally lies on a subsoil of sand, and is protected by dunes from the inundations of the river. If, on the breaking up of the ice, the water rises considerably, the inhabitants seek to stem the tide by raising the dike; but the combined exertions of the inhabitants of the villages are often not sufficient to avert the danger, by reason of another circumstance. The embankment thrown up, itself composed of firm soil and girded with solid wicker-work, would be quite able to resist the lateral pressure of the rising waters; not so the sand stratum, however, on which it is erected. While all are busied on the top, raising it, there suddenly bursts out behind it a well-ground, that is, the ground is covered with springs that bubble up with increasing force, bringing quantities of sand with them; the undermined embankment falls in with an awful crash, and the lowlands are covered with water. It is an incorrect conception of the matter to say, the sand which after such a catastrophe covers the fruitful soil, is the sand from the river; we should much rather say, that in the turmoil of waters the fruitful top-layer is carried away, laying bare the sandy subsoil. The white stripes, therefore, like the foot-paths on a meadow, lie deeper than the green sward. Berlin has, unfortunately, well-ground; accordingly, when the Spree is at high water, the cellars are filled. Van Oesfeld has published a chart of the most considerable of those inundations.

The difference between the coldest and the warmest month in the year, for the surface of the ground in Berlin, amounts to 13.64 degrees; at one foot below the surface, to 12.95; at two feet, to 10.69; at three feet, to 9.14; at four, to 8.51, and at five, to 7.95. According to this rapid decrease, we can calculate that at a depth of twenty-four feet below the surface, there will be but half a degree of heat, and at from sixty to seventy feet there will be scarcely any traces of it left. The so called variable stratum has, according to this, not even 100′ of power. Springs show, therefore, that the deeper the horizontal part of the *nappe d'eau* is embedded in this variable stratum, the more equal is its heat. Thus it comes that adjacent springs often differ considerably in this respect. At Marienberg, near Boppard, Hallmann's minute and careful observations have proved a yearly difference in the heat of the atmosphere of 15.72 de-

grees; at Michael's spring, of 7.73; at Hassborn, 4.77; at Mühlthalquelle, 2.99; the Hirschkoppquelle, 2.62; the Salzbrunnen, 2.14; and at the Louisenquelle, 0.96; while the chief source, (Quelle), that one which feeds the whole bathing establishment, the Orgelborn, only of 30.54 degrees. And this variability is not simply observable in mountain springs, but also in those of the plain. In Cenitz, after many years' observation, the difference between the coldest and warmest month amounted in the one spring to 3.06, in another to only 0.46, while the atmosphere showed 17.22 degrees of heat. The Gesundbrunnen, in the Oranienburg suburb of Berlin, varies only three-tenths of a degree within a year. The skater is therefore not a little astonished when he finds the same spot in the pond bubbling up through the ice, that in summer, while bathing, he had avoided on account of the cold. In the torrid zone, where the heat is equal throughout the year, and the difference between day and night greater than between summer and winter, the above is an every day appearance. Lucretius, for instance, tells of a source near the temple of Jupiter Ammon in the oasis, which was colder in the day, and warmer at night. The earth, adds he, is like a folded hand; in the cold it doubles itself up to prevent the internal warmth from streaming forth; in external heat it opens, and the earth cools because the internal warmth escapes. What a graceful explanation this is! It is a pity, however, that it is perfectly false, for the thermometer shows us that what is here explained, viz: the variation in the temperature of a spring, does not exist at all.

The best spring in the Tropics can afford little refreshment, as the mean differs but little from the heat in the hottest months. While with us everything grows fresher and stronger around them, in Lapland and Iceland they are a curse for vegetation by bringing their icy cold into the short, hot summer. A source in Cumana $= +20°$, differs from the hottest month $= 23.3°$, only about 3.3; in Cairo, about 5.9; in Strasbourg, 7; in Upsala, about 8.6. But even here nature avoids the extremes permitted her, for while in Basle the temperature of the springs is equal to the mean heat of the atmosphere, in the tropical regions they are below the mean, while in the frigid zone they exceed the temperature of the ground by several degrees. It is hardly

necessary to add, that the rainy season, above all other causes, exercises an influence on those varying conditions. But even supposing an equal division of the quantum of rain within the annual period, there are manifest reasons for the temperature of the springs being higher, in higher degrees of latitude, than the atmosphere. In the severe cold of winter, for instance, the water is prevented penetrating the frozen ground, till a thaw sets in; in other words, till the degree of warmth is higher. Hence the mean heat of the water which feeds the springs must of necessity be higher than the mean heat of the atmosphere. If we penetrate through the variable stratum, deeper into the ground, the degree of heat, it is true, remains unchanged throughout the whole year, but rises the deeper we go. While our springs on the surface have 8° of heat, the water in the bore at Rüdersdorff, 700 feet below the level of the Baltic, has 18.2; in the bore at Rehme, near the Porta Westphalica, 2,144 feet deep, 18.2; and on boring the well of Grenelle, in Paris, it rose from 8.50 to 22.2, when, at a depth of 1,683 feet, at length penetrating the chalk bed and reaching the green sand, which slopes off at Tours, they came upon a water-bed, the ascending power of which was so great, that in Grenelle people used to climb up a high mast in order to see at the top of it, the water flowing out in the shape of a shell.

There is therefore no difficulty in understanding the origin of hot springs, both as concerns the height of their temperature and their variability, which a comparison between the observations of Carrere in the year 1764 and those of Augladd in 1819 clearly proves; though at first Augladd fancied the results he had obtained were opposed to those of Carrere, not having remarked the thermometer the latter had used was divided differently from his own. In Mont Dore people now bathe in a hot spring with 30.7° of heat; this same spring was used in the days of Julius Cæsar, without its first undergoing a cooling process. Now, as one can stand the hot bath at Ronssillon (40°) for only three minutes, and in water of 36° about eight minutes, the springs must have retained their degrees of heat since the days of the Romans; unless, indeed, they all had skins like the Turk whom Marshal Marmont saw tarrying for a long time in a bath with 60°. It no longer strikes us as extraordinary, that

the hot springs appear first where the cuttings in the primitive rocks are deepest; or that their temperature generally rises the nearer we come to the granite axis of the mountain; as there, that which once formed the interior having been forced to the surface, the deeper the water can penetrate, the more probable it appears. Thus it becomes clear that while the springs in Roussillon, at Olette, show 70°, those of Dax, in Foix, only 60° of heat; those of Bagneres de Luchon, farther west, 50°; those of Baregcs, 40°; the eaux bonnes and les eaux chaudes in the valley of Ossau, 30°, and lastly, those of Cambo, not far from Bayonne, and farthest from the chief mass of granite in the Pyrenecs, only 17°. That the hot mineral waters owe their heat to their springing from a great depth, is corroborated by the chance discovery of a spring with 40° of heat, in a copper mine 1,350 feet deep, at Wheal-Cliffort, near Redruth in Cornwall, the temperature of which almost entirely agrees with that of the Bath wells.

It is no contradiction to the above to say that springs sometimes vary their degrees of temperature considerably in consequence of earthquakes, for by such displacement of the rocks their connection with deeper-lying strata may either be cut off, or opened up. After the great earthquake at Lisbon in 1755, the Source de la Reine in the springs of Bagneres de Luchon rose forty degrees, thus being transformed from a cold into a hot spring, while the reverse took place in a spring in Bagneres of Vigorre, in consequence of a great earthquake in the year 1460. When, on September 29th, 1759, the Jorullo in the municipality of Valladolid, rose at a distance of thirty-six miles from the coast and forty-two from any other active volcano, the rivers Cuitimba and San Pedro, near the Cerro de St. Ines, were lost. Their clear waters had once irrigated the sugar-cane fields of the adjacent hacienda. At a distance of six hundred feet off, there broke out in their place two rivers from the clay vault of the Hornitas, in whose waters Humboldt saw the thermometer rise to forty-two degrees.

[*From The Student and Intellectual Observer.*]

POPULAR DELUSIONS ON TECHNICAL EDUCATION.

[Though printed originally for English readers, the sound sense of the article ought to commend it to American readers.]

It will only be by a great effort that the average families of the middle class in this country will be induced to become cultivators of science. Amongst the aristocracy science has a very few distinguished students, but no branch of it can be said to be fashionable, and whenever subjects that require a knowledge of physics, chemistry, or physiology, come before either House of Parliament, a very deplorable amount of ignorance is sure to be displayed. It is, moreover, very rare to find a Cabinet Minister possessed of even elementary education in such a direction, and members of military and naval professions, who have abundant opportunities for making valuable observations, do not find any official encouragement for such an application of their leisure time. The late Prince Consort endeavored to raise the tone of education amongst the upper classes, but since his death they have shown but little inclination to follow his example. If we look to rich mercantile and trading families, we find as a rule that physical sciences are not much in favor. If one of the sons is to be destined for the medical profession, he first receives an ordinary classical education, and then, with the help of professional "crammers," makes his way as fast as possible through the routine of subjects on which he has to suffer examination. Hence, although it would be easy to make out an honorable list of surgeons and physicians who rank amongst original observers and discoverers, the average "doctor" can scarcely be pronounced a scientific personage, and it is not uncommon to find men in considerable practice who make the most absurd mistakes if they try to talk upon a scientific subject. Another son may be intended for the Church, and he is not troubled with science, because neither his parents, his tutors, nor the public have yet arrived at the idea that some accurate knowledge of the works of the Creator is necessary in a profession supposed more than others to be dedicated to his service. A third son may be brought up as a merchant, and a

fourth sent to the bar, butl ike their brothers they will learn no science unless strong personal predilections incline them to its pursuit.

We have recently heard of Oxford and Cambridge M. A.'s perfectly bewildered with a simple astronomical telescope, and nothing is more common than for dealers in astronomical instruments to have them returned with most astounding complaints, arising entirely out of profound ignorance of elementary laws. In one case that came under our notice, a well-to-do gentleman thought himself aggrieved because a barometer, when carried to a particular place outside the house, did not stand at the exact height at which another barometer, used on another occasion, did stand, as mentioned in a book.

There are throughout the country Field Naturalists' Clubs, and similar institutions which do much to further natural history pursuits, and we have a considerable body of astronomical observers scattered in various directions. Still, few take the pains to do anything that is difficult, or to acquire information that demands study or thought; out of a hundred persons who like to join a pleasant excursion, and bring home plants, or bottles full of aquatic curiosities, can it be said that five take pains to learn anything of vegetable physiology, to understand the principles on which botanical classification is based, or to do more than to look at the appearance, and pick up from some one else the name of an insect or infusorian?

It is not with a view of depreciating the attainments of our countrymen that we write these remarks, but for the sake of showing the sort of stem on which efforts are being made to graft technical education, and in hope of giving timely warning of errors into which the public seem likely to fall.

The prevailing want of scientific knowledge leads to false conceptions of what should be done, now that "technical education" is demanded as an indispensable aid to national prosperity and wealth. There is a notion abroad that professors of science are to teach those portions of their several subjects which can be warranted to pay. "Practical men," that is, persons who act by what is vulgarly known as "rule of thumb," do not want their sons to be taught "theories"—they demand on their behalf what they call "facts." To the chemist they

say, what do we care about your theories of composition, your atoms, molecules, laws of substitution, compound radicals, organic basis, and so forth. We want our boys to grow up with the ability to print cotton, smelt iron, tan skins. They fancy the botanist can tell their offspring how to find new gum trees, or discover fresh dye stuffs, and so forth, without elaborate inquiries into the organs of fructification, and the relative disposition of parts. Students of medicine coming from unscientific families are often much annoyed and puzzled if a well-informed lecturer brings before them any of the doubts and uncertainties that remain to be cleared up about the structure of organs or their functions. They want positive information. They wish disease to be made as plain and palpable as a letter-box, and the cure by the administration of a bolus to be as simple as the insertion of an epistle into its appropriate slit.

Persons brought up in what may be fairly called the unscientific atmosphere of commonplace English life, have immense difficulties to contend with when they start on a scientific career. Their habitual modes of thought have created an inaptitude for scientific methods, and amongst their relatives and friends perhaps not one has a particle of sympathy for any of those intellectual pursuits. In London, and very large towns, there are scientific groups to which access is easily obtained, but in smaller towns and rural districts an astronomer, a botanist, or a microscopist often finds himself alone. Scores of letters have reached us with complaints of this description, and we could point to many individuals who, under a more rational state of society, would be local centres of scientific intelligence, but who now work like hermits, because the world around them is an intellectual desert, from which they can rarely escape.

A sudden demand for "technical education," without a previous or accompanying one for a general education leading up to it, is much like an application to have a house roofed and its chimney-pots fitted out before the foundation is laid, or the walls are reared. The application of scientific principles to any special calling must necessarily and logically come after those principles have been fairly learnt, and it would be impossible to devise courses of study for chemistry, or geology, or physics,

that were particularly adapted to cotton-spinners or iron-founders, and not as useful for other sorts of men. After the general principles and the leading facts of a science have been mastered, its special applications may fairly begin; but special schools should be subsidiary to general schools, and cannot possibly be substituted for them.

If society determined that in a given number of years it would rear up, say a thousand good dyers and smelters, the most certain way to success would be to give a very much larger number of persons a good elementary education in science, and select the most fitting for the more special culture. It would be a waste of time for those who have no taste or inclination towards the sciences to be forced into their prolonged study. To know a little of such matters should be considered, like writing or elementary arithmetic, an essential part of the education of all, and the requisite means should be provided for all. More advanced teaching should be abundantly and cheaply provided for those who desire it; but no attempt should be made to drive unwilling students through such a course.

In early life tastes are frequently formed which determine the whole current of future endeavor; but some fact or incident is necessary to make the child aware of its natural tendencies. Simple explanations of common phenomena, or the example furnished by seeing others take an interest in particular subjects, may occasion the germination of powers that would have lain dormant without them. If we consider the small proportion of families in the well-to-do classes in which children are likely to have such advantages in reference to the sciences, we may readily believe that only a very small proportion of the scientific capacities of the country can possibly be brought out until a considerable change in the influences which surround childhood and youth have been brought out.

Science for all would soon lead to remarkable proficiency on the part of a naturally selected few, while the attempt to deal with great branches of mental culture as if they were simply part of the plant or utensils of a manufacturing business, will lead to no satisfactory result. Technical processes can rarely be thoroughly understood by professional teachers. The practical dyer, or spinner, or smelter, finds his commercial success

dependent upon details which no lecturer could teach; and if it were possible for school or college instruction to be really successful in making pupils understand how processes were conducted at a particular moment, the very next day fresh processes might be introduced that would render the information of little avail. Of course, if the public demand "technical education" as a substitute for a real education, they will find plenty of quacks ready to supply it for a consideration. There are folks quite ready to keep an emporium of technical education, just as others open a general shop. Chemistry for dyers, botany for perfumers, electricity for telegraph men, and mechanics for engineers, will be put up and sold like candles and blacking, red herrings and cheese. The Government will, of course, be appealed to by scientific bagmen touting their wares, and the shade of the Prince Consort invoked to cover any impudent job that may be supposed to need a screen.

Parallel with sham science will run the course of sham art—drawing for the crockery trade, coloring for floor-cloth manufacturers, or perspective for paper-hangers, will be put forth in glaring prospectuses, and proficient pupils will be promised a certificate or a prize. No honorable man who knows anything about science would mix himself with such quackery. A real chemist knows that there is only one science, which he is named after; and that he cannot subdivide it according to the trade of his pupils' parents, or the kind of calling by which they are expected to grow rich. He has not one chemistry for doctors, and another for glass-blowers; nor does he know any way of teaching except by exhibiting and arranging facts so as to make them illustrate principles and expound laws. The abstruser departments of his science, so far from being the least fitted for those who are about to enter manufacturing industry, are the most essential to any one who is desirous of discovering new products, or improved methods of working those which are already known. Those who have followed the admirable papers of Mr. Barff in our pages will be able to appreciate this fact, and it could not for a moment be doubted by any real proficient in the science. The doctrine of substitution, for example, belongs to a difficult portion of chemical theory. It explains how, in a series of complex substances, certain elements, or certain

compounds capable of behaving like elements, may take each others' places. The entire set of compounds so obtained belongs to one class or series, and they have certain properties in common; but the substitution of one element for another may make exactly enough difference to serve some important purposes in practical life. A department of chemistry which enters importantly into industrial pursuits is that of synthesis—the artificial formation of compounds exactly resembling, or analogous to, the productions of nature in the animal kingdom, or in the organic world. Suppose, for example, a chemist were asked to make quinine in his laboratory, instead of obtaining it in a roundabout process by inducing somebody to grow trees in India from plants collected in America, getting their bark sent to England, and then operating upon it in various ways. The problem would be a hopeless one in the hands of a student who had merely learnt the stuff called "technical chemistry," but very likely to succeed through the labors of another, who had clear ideas of the theory of the science, and who knew how similar productions are formed by nature herself.

The most successful advances in manufacturing chemistry will be made by those who, having the best understanding of the theoretical composition of bodies, are best able to perceive in how many ways they may be taken to pieces, and what groups of new combinations the several portions may be able to form.

Chemistry affords some of the clearest arguments to show the folly of a "technical" in contradistinction to a real theoretical and scientific education. Theories of science are not mere hypothesis or supposition. They may not always be right, and they should always be held subject to correction or further elucidation. Their value lies in their quality of co-ordinating facts that belong to the same category, to their enabling reason to be exercised in the consideration of phenomena, and in their indicating the means by which it is possible a control over nature may be obtained. A statement of a law is a short-hand epitome of a group of facts. It matters not how large the group may be, the formula in which the law is stated comprehends them all. Without theories, all sciences would be resolved into their primitive elements; they would consist merely of huge heaps of facts which no memory could recollect. A

science treated without theory is worse than even the Chinese language with its thousands of characters; the theory comes like a phonetic alphabet, and makes a few symbols to express the whole.

The sciences and the fine arts, as instruments of training and development, deserve a recognitian very different from that which the cant and quackery of "technical education" contemplates. Learn science from a love of truth, and for the pleasure as well as for the duty of exercising our faculties upon the phenomena around us. Study art because the perception of the beautiful elevates and adorns our lives. In thus obeying natural laws of mental development, mercantile profit will come in its due place.

[*From The National Teacher.*]

METHODS OF CONDUCTING RECITATIONS.

I. THE CATACHETIC METHOD.—The chief merit of the question method is its *thoroughness.* When skillfully used, it may be made a most searching test of the pupil's knowledge. A very superficial knowledge of a subject will enable a pupil to talk on it or about it, but the answering of a few well-directed questions is another matter. There is no ignorance which a question cannot fathom and expose.

The question method permits *a systematic unfolding of the lesson;* the teacher has the order not only of the topics, but also of the facts of each under his control, and he can give due prominence to the more important. It is unnecessary to discuss the value of this advantage.

The question method also permits the *imparting of much incidental instruction.* The pupil may be indirectly led to new facts and views, and information of interest and value may be added by the teacher.

That the above advantages may be secured, it is necessary that the questions asked be *clear, concise, and definite.* An ambiguous or indefinite question causes hesitancy, and justifies a loose and pointless answer. The character of the teacher's questions largely determines the character of the pupil's answers.

The teacher's questions should be so arranged that they may unfold the subject *logically* and *methodically*, bringing out clearly that which is important and fundamental. The order in which a lesson is unfolded is a very important matter. The pupil's knowledge may thus be made clearer and more permanent, or it may be confused and muddled. In preparing himself to conduct a given recitation successfully, the teacher must keep these objects before him. His questions must be carefully studied; they must serve as searching tests, and at the same time as aids to the pupil in reducing his knowledge to a system —in separating principles from details.

All questions that suggest the answer, or lead the pupil to it, technically called "leading questions," are worthless as tests, and should be carefully avoided. The same is true of questions that can be answered by "Yes" or "No." The pupil is, indeed, more likely to answer such questions correctly than incorrectly, and this is true whatever may be his ignorance. The manner in which the question is asked, the suggestive look or "nudge" of a fellow pupil, or some other conscious or unconscious hint, may make correct guessing quite easy. It is scarcely necessary to remark that knowledge guessed out in this way is a very doubtful good—a very uncertain possession. Indeed, we look upon the practice of helping pupils through half-prepared lessons by leading questions and otherwise, as not only useless but pernicious. It deceives the pupil respecting his ignorance, and begets vicious habits of study. The requirements of the recitation must rigidly hold the pupil responsible for whatever knowledge is within his reach; and the fact that he has failed in his efforts to reach the same, must be disclosed before the needed assistance is given.

We are thus led to the fact that the thorough questioning of a class on a given subject, requires thorough knowledge and careful preparation on the part of the teacher. His questions must bear the stamp of his own thinking—must be the coinage of his own brain, dropping from the mint bright and hot. "The asking of questions from the book" is exceedingly objectionable —what General Garfield aptly calls, the feeding of one's pupils on "cold victuals." The author's questions may be models in form and arrangement, but their slavish use in the recitation

degrades the teacher to a mere machine, and his teaching to a mechanical and lifeless routine. The proper function of printed questions is to assist both teacher and pupil in preparing for the recitation—the former in modeling his own questions, and the latter in "proving," or testing his knowledge. A teacher must have sufficient command of good English, and a sufficient acquaintance with the subject he teaches, to ask his own questions.

The chief defect of the method of conducting recitations by questions is its failure to cultivate sufficiently the *pupil's power of expression.* This defect may be overcome, in part, by requiring pupils to give full and complete answers. Most of the answers received in our schools consist of two or more words not forming a sentence. Catechizing teachers, as a class, use more words in asking questions than their pupils do in giving their answers. Pupils should be required to answer questions in complete sentences.

A second defect of the question method is its failure to necessitate systematic thought and study in preparing the lesson. This defect is most marked in classes whose study consists in attaching ready-made answers to the printed questions found in their text-book, which is about as mechanical as the fitting of pegs to holes of different sizes. The real subject under consideration is wholly lost sight of. The studious pupil learns to fit a thousand answers to as many questions concerning his own country, without catching one inspiring glimpse of the grand reality which unwittingly he has viewed piecemeal. It is true that the pupil may be driven into the recesses of the subject by questions that fly red-hot from the teacher's own brain, but such results are exceptional. The general fact is, that the method of reciting by questions fails to necessitate the classification and methodical arrangement of knowledge by the pupil. It is not enough that the pupil acquire knowledge classified by others; the work of classifying must be done by himself.

II. THE TOPIC METHOD.—What we have said respecting the weakness of the catachetic method will enable us to present in a clear light the advantages of the topic method. It cultivates *expression.* In reciting a topic the pupil is obliged to tell what

he knows of it in successive sentences. He thus acquires a command of language which it is impossible for him to gain in giving brief answers to specified questions.

It forces the pupil (if his recitations are not *memoriter*) to view the subject *as a whole;* to grasp its essential facts and principles, and arrange all that he has learned around them. This affords a fine mental drill, and the pupil who thus studies cannot well fail to obtain a clear and thorough knowledge of his lessons.

But the topic method requires a clear-headed, thorough teacher to use it with success. In the hands of a superficial teacher it often degenerates into mere talking, the pupil failing entirely to state what is most essential to be known, and giving, instead, comparatively unimportant details. Such recitations are exceedingly deceptive. As a general rule, the topic method is better adapted to advanced than to primary pupils, and has a wider application in reviews than in advancing lessons. It can be used most successfully in teaching such branches as history and geography, but may be used in all branches, not even excepting spelling.

In our judgment the most efficient method of conducting recitations is to unite these two methods. The pupil's lessons may be prepared, and in the main recited on the topic plan. His knowledge should, however, be frequently tested by searching questions. Whenever he discloses an imperfect understanding of the subject, the teacher should ply him with questions.

With advanced pupils the topic method may be so modified as to require the pupil to give a complete analysis of the topic before he attempts to fill up the outline with details. This is, indeed, worthy of being called a third method.

From the Iowa Classic.

ART EDUCATION.

The importance of Art Education in all our schools, common and higher, is attracting attention in the more intelligent communities of our country. The feasibility of its introduction

universally especially, in its more fundamental principles, as seen in Drawing, is continually receiving increasing demonstration. We speak of its importance, not so much as an excellent instrument of æsthetic culture, as to its application to increase the grade and gains of almost all departments of industrial activity. We wish to direct the attention just now to two points: FIRST, *The feasibility of the almost universal acquisition of skill in Drawing*, and SECONDLY, *The financial advantage of it in industrial employments.*

FIRST, It is asserted by experienced persons that "whoever can learn to write, can learn to draw." Mr. Walter Smith, the State Director of Art Education in the public schools of Massachusetts, from whose work on "Art Education, Scholastic and Industrial" we shall quote at this time and probably hereafter, asserts that "there are but four classes of human beings whom it is not found practicable to instruct in Drawing. They are the blind, the idiotic, the lunatic, and the paralytic. Of the rest of mankind and womankind, exactly a hundred per cent can be taught to draw." A convention of School Masters in London, who had for a year, as an experiment, made instruction in drawing general in their schools, passed this resolution: "That half of the time previously given to writing had been given to drawing, with the result, that the writing had been better and the power of drawing was a clear gain." It was found by thorough experiment that about one hundred per cent of school children could be taught to draw. The ancient notion that genius necessarily monopolized art power was thus exploded. In Boston it has been found by fair experiment that not only children but adults of nearly all ages could learn to draw. The Boston evening classes have pupils varying from fifteen to sixty years of age, steadily and surely acquiring skill in drawing. And such we think will be the result wherever range is given to fair experiment.

SECONDLY, with reference to the financial advantage in industrial employments, experience bears favoring testimony. Mr. Smith says: "The use of drawing in the workshop and office needs but little demonstration; seeing that, without its skillful practice, many trades and manufactures and several professions cannot get on at all. * * * I venture to say, that in every

workshop or factory where no knowledge of drawing is possessed by the workmen, there is a waste of material, waste of time, and an inferior article produced in the end. * * * Art Education in the form of industrial drawing, whatever it may cost the country, will be repaid to it in the increased value of industrial products; it will develop the intellect of the people in an eminently practical direction; and there will be no workshops standing still, because the one man who understands working drawings happens to be away." Prof. Thompson of the Worcester Technical School says: "A boy who spends two hours a week in drawing, and the rest of the time in working at the bench, learns his business faster, and becomes more skillful in it, than one who works all the time." Again: "It is calculated that the productive efficiency of every machine shop would be increased thirty-three per cent if every journeyman could read any common drawing and work by it." We might multiply testimony from different departments of industrial labor to the great importance of the early and universal attention to the subject of elementary drawing.

In Massachusetts schools there are five subjects of elementary drawing, including 1. Freehand Drawing; 2. Model or Object Drawing; 3. Memory Drawing; 4. Geometrical Drawing; 5. Perspective.

INFLUENCE OF FORESTS ON CLIMATE.

1. Does the wooded condition of a country exercise an influence upon the amount of rain it receives?

The answer to this question was attempted by taking two stations at equal height above the sea, but separated between fifteen and twenty miles, the one situated in a wooded, and the other in a cultivated country, and observing the rain-fall. The result reduced to inches, was, that at the agricultural station the rain-falls for the three seasons was 82.02 inches, and at the forest station, 93.13 inches; difference in favor of the forest station, 11.11 inches.

2. Does the covert of the forest, by intercepting the rain falling from the atmosphere, diminish to a considerable extent the amount of rain that reached the ground?

This was answered by placing rain-guages beneath the trees, and in the open ground close at hand, and comparing results, which were as follows: In the open ground, 92.09 inches; under the trees, 87.74—excess in open ground, 4.35.

This shows that while some of the rain-fall in the forest does not reach the ground, still, by comparing what did reach it with the result at the agricultural station, we have 87.74 inches for the rain-fall under the trees, and 82.02 inches for the fall at the agricultural station, an excess of 5.72 inches in the forest.

3. What is the effect of a wooded country on the conservation of the moisture received by the soil?

The answer was sought from a comparison of the evaporation from two equal vessels, one placed in the forest, the other in the open ground. Evaporation went on five times as rapidly, taking the whole year into consideration, in the open ground as in the forest, ranging from three to six times between April and July. Eighty-five per cent of the rain falling from the open field evaporated, while only 22 per cent of that falling in the forest was lost.

4. What is the influence of forests upon temperature?

The experiments in this direction had been conducted but a short time, but go to show that the mean annual temperature in the woods is lower than in the open country, and that the difference is least in winter and greatest in summer. In 1868 the mean temperature of the forest was lower than that of the open fields by 4 deg. 35 min. in the morning, and 9 deg. 33 min. at night in July; which difference fell in December to 48 min. in the morning, and 49 min. at night. Again, the average variation in temperature was much greater in the open country than under cover of the forest, between day and night. It ranged from 05 min. to 8 deg. 57 min. in the open air, but only from 04 min. to 1 deg. 22 min. in the forest.—*Western Rural.*

MISCELLANY.

TYNDALL'S YOUTHFUL EXPERIENCES.—Not as a servant of Mammon do I ask you to take science to your hearts, but as the strengthener and enlightener of the mind of man. Might I now

address a word or two to those who in the ardor of youth feel themselves drawn towards science as a vocation. They must, if possible, increase their fidelity to original research, prizing far more than the possession of wealth an honorable standing in science. They must, I think, be prepared at times to suffer a little for the sake of scientific righteousness, not refusing, should occasion demand it, to live low and lie hard to achive the object of their lives. I do not here urge anything upon others that I should have been unwilling to do myself when young. Let me give you a line of personal history. In 1848, wishing to improve myself in science, I went to the university of Marburg—the same old town in which my great namesake when even poorer than myself, published his transaction of the Bible. I lodged in the plainest manner, in a street which, perhaps, bore an appropriate name while I dwelt upon it. It was called the Ketzerbach—the heretic's book—from a little historic rivulet running through it. I wished to keep myself clean and hardy; so I purchased a cask and had it cut in two by a carpenter. Half that cask, filled with spring water over night, was placed in my small bed-room, and never during the years that I spent there, in winter or in summer, had the clock of the beautiful Elizabetherkirche, which was close at hand, finished striking the hour of six in the morning before I was in my tub. For a good portion of the time I rose an hour and a half earlier than this, working by lamplight at the differential calculus when the world was slumbering around me. And I risked this breach in my pursuits and this expenditure of time and money, not because I had any definite prospect of material profit in view, but because I thought the cultivation of the intellect important—because, moreover, I loved my work, and entertained the sure and certain hope that armed with knowledge, one can successfully fight one's way through the world. It is with the view of giving others the chance that I then enjoyed that I propose to devote the surplus of the money which you have so generously poured in upon me. In the education of young philosophers in Germany, I ought not, for their sake to omit one additional motive by which I was upheld at the time here referred to—that was sense of duty. Every young man of high aims must, I think, have a spice of this principle

within him. There are sure to be hours in his life when his outlook will be dark, his work difficult, and his intellectual future uncertain. Over such periods, when the stimulous of success is absent, he must be carried by his sense of duty. It may not be so quick an incentive as glory, but is a nobler one, and gives a tone to a character which glory cannot impart. That unflinching devotion to work, without which no real eminence in science is now attainable, implies the writing at certain times of the stern resolve upon the student's character: "I work, not because I like to work, but because I ought to work." In science, however, love and duty are sure to be rendered identical in the end.

WHILE the Atlantic has its Gulf Stream, the Pacific has one as much grander as the ocean through which it flows. This is called the "Japan Current." It takes its rise in the Indian Ocean, moves northward along the eastern shore of Asia, as the Atlantic Gulf Stream hugs the American shore, until it strikes upon the Aleutian Islands and Alaskan Peninsula. Here it is divided. One portion moves northward through Behring Sea and Straits, eastward through the Arctic Ocean, southward through Baffin's Bay and Davis' Straits, and still southward along our Atlantic coast, giving us cold northerly and easterly winds and good fish. This accounts for the abundance of icebergs in the Atlantic, while none are ever seen in the Pacific. The Japan Current, flowing from the Pacific into the Arctic Ocean, and thence into the Atlantic, carries all icebergs with it. The other and much larger portion of the Japan Current is bent southward by the elevated bed of Behring Sea and the Alaskan Peninsula, and flows along the western coast of America as an off-shore current until it strikes upon Cape Mendocino, in California, where a portion turns again northward as an immense in-shore eddy, while the remainder moves on southward until, by its greater specific gravity, it sinks beneath the surface and is lost.

THE composition of the atmosphere, the general temperature, and the sublime and strongly-contrasted scenery of the "Great West," produce an exuberance of spirits, a luxury of existence, an intense enjoyment of animal life, nowhere else experienced on

the continent. The reasons of this are, that climate embraces a great variety of phenomena, and that temperature depends far less upon degrees of latitude than upon certain lines, which climatologists call *isothermal* when they are drawn through places having the same mean annual temperature, *isotheral* when they are drawn through places having the same summer temperature, and *isochimenal* when through places having the same winter temperature. Unlike the lines of latitude, these climatic lines follow very eeeentric courses ; and it is a remarkable fact that the isotheral and isochimenal lines, which on the eastern portion of our continent follow the degrees of latitude, have a very decided trend to the northwest after leaving the region of the great lakes, while in many places on the Pacific coast they run nearly north and south.

SEWING IN THE PUBLIC SCHOOLS.—The following is an extract from Dr. Waterson's quarterly report to the school committee upon the Everett grammar school located on Northamton street, Boston : "Six classes are now taught the use of the needle, which is considered a very great advantage. This important branch of female education has hitherto been too much neglected. It has such direct bearing upon the practical duties of life, that one might expect it to hold a pre-eminent place in any well considered scheme of female education. There may be more showy or pretentious departments of instruction for girls, but there is nothing which will have a more powerful influence upon their coming life as sisters, daughters, wives and mothers. The committee would urge upon this Board the introduction, as far as practicable, of the general, systematic and thorough instruction in sewing, that it may hold at least as important a place in the education of girls as music and drawing which, though greatly desirable, are certainly no more so to any young woman than the proper and skillful use of the needle."

THE faith in lesson books and readings is one of the superstitions of the age. Even as appliances to intellectual culture, books are greatly over estimated. Something gathered from printed pages is supposed to enter into a course of education ; but, if gathered by observation of life and nature, is supposed not thus to enter. Reading is seeing by proxy—is learning indirectly through another man's faculties instead of directly through one's own faculties, and such is the prevailing bias that the indirect learning is thought preferable to the direct learning, and usurps the name of cultivation.—[*Herbert Spencer*.

DEPARTMENT OF PUBLIC INSTRUCTION.

IN THE February number of the TEACHER will appear the first of a series of articles "On the Physical Geography of California," written for this journal by Professor J. D. Whitney, State Geologist. Professor Whitney stands in the front rank of American and European *savants*, and the high encomiums bestowed upon his work in connection with the Geological Survey of California, will in some slight measure indicate the value of the articles which he will write for the TEACHER. The articles will bear special reference to the wants of the teacher in teaching Local Geography.

SEVERAL ARTICLES have been promised by H. Edwards, Esq, the well-known entomologist, on the entomology of the Pacific Coast. Several articles on the Botany of California are nearly completed, and their publication will soon be commenced. Professor Davidson, of the United States Coast Survey, will, perhaps, furnish some articles on the Physical Geography of the Pacific Ocean. Whenever necessary, the several articles will be illustrated; so that the teachers of this State will have a complete work on the Local Geography of California.

THE GEOLOGICAL SURVEY has published a map of California and Nevada, which for accuracy and beauty of workmanship, excels any map heretofore published. The low price—$3 50—places it within the reach of every district; and we advise teachers to purchase a copy immediately, as from the limited number printed, the supply will soon be exhausted.

SOME UNFORESEEN difficulties have arisen in the proposed publication of the *Manual*, which is to accompany the Revised Course of Studies. These difficulties are so serious that they will retard, if not altogether prevent, the publication of the *Manual* in a pamphlet form. If no other way remain, the *Manual* will be published through the TEACHER.

PASTEBOARD CARDS, containing the Course of Studies are in active preparation, and will shortly be ready for distribution. Schools will be supplied *only* through County Superintendents.

AT A meeting held December 13th, 1873, the State Board of Examination revoked the certificates and diplomas heretofore granted to S. C. Stevens.

THOUGH WE have repeatedly published the list of Text Books which are adopted by the State Board of Education, and which alone can be used in the public schools of this State; and though the Course of Studies specifies which works are to be used in the several divisions and grades of the schools, we still receive frequent inquiries whether such and such a book cannot be used in school. We therefore republish once more the text books adopted by the State Board of Education, and we state here distinctly, that any book not included in this list cannot be used in the public schools of California.

List of Text Books adopted by the State Board of Education:

In Reading—McGuffey's Series.
In Arithmetic—Robinson's Series, except Intellectual Arithmetic.
In Intellectual Arithmetic—Colburn's.
In Grammar—Brown's Series.
In Word Analysis—Swinton's Word Analysis *only*.
In History—Swinton's Condensed History *only*.

In Natural Philosophy—Hotze's First Lessons in Physics.

In Drawing—Walter Smith's Teachers' Manual for Free-hand Drawing in Primary Schools. Price 25 cents; to be used by teacher only.

In Geography—Monteith's Series.

In Penmanship—Payson, Dunton & Scribner's System.

In Physiology—Cutter's.

A MEMBER of a County Board of Examination asks whether a County Board can legally endorse or grant new certificates to holders of certificates granted in some other county? We have stated several times that a County Board can grant certificates *only* upon examination, or upon a Normal School diploma. A County Superintendent may issue temporary certificates to persons holding certificates of like grade granted in other counties, but such temporary certificates are valid only until the next regular meeting of the County Board, and cannot be renewed or their time extended. Any certificate granted in any other manner than as above specified is *illegal*.

WE HAVE been asked whether there is not an inconsistency between Section 1621 and Section 1623 of the Political Code? The former section provides that "the Board of Trustees and Board of Education must use the school moneys received from the State or county apportionment during any school year exclusively for the support of schools for that school year." The reason of this provision of the law is plain; for otherwise the Board of Trustees or Board of Education might, during any school year, use the funds, not only of that school year, but also of the next succeeding year or years, and thus leave the district without funds to keep up a school for that year. Hence, it is also very plain that the Board of Trustees cannot make any contract with a teacher, the meeting of which will go beyond the funds accruing to the district for the school year for which the contract is made. In other words, a Board of Trustees can contract with a teacher for only such a length of time, and at such a salary as can be paid out of the funds to the credit of the district for the school year for which the contract is made. So that, in our opinion, the provisions of Section 1623, that "Boards of Trustees are liable as such in the name of the district for any judgment against the district for salary due any teacher on contract, and for all other contracts, * * and they must pay such judgment or liabilities out of the school moneys to the credit of such district," are applicable only to cases in which Boards of Trustees made contracts which could be satisfied out of the funds to the credit of the district for the year for which the contract was made. If a contract is made the meeting of which will absorb funds belonging to some succeeding school year, the district, in our opinion, cannot be held liable.

THE STATE BOARD OF EDUCATION

Met at the office of the Superintendent of Public Instruction, November 28th, 1873, at 2:30 P. M.

Present—Messrs. Lynch, Baker, Jackman, Allen and Bolander.

Absent—Governor Booth, Messrs, Leadbetter, Widber, and Jones.

In the absence of Governor Booth, Mr. Baker was called to the chair.

The minutes of the meeting of June 28th, 1873, were read and approved.

On recommendation of the State Board of Examination, Life Diplomas were granted to the following persons:

Manning, Miss Agnes M. San Francisco.
Cooke, Miss Hannah, San Francisco.
Milliken, Mrs. Ellen A., San Francisoo.
Lamb, Miss Irene, San Francisco.
Anderson, Mrs. C. A., San Francisco.
Burke, Lizzie K., San Francisco.
Levy, Daniel, San Francisco.
Hurley, Miss J. M. A., San Francisoo.
Stineen, Miss Alice M., San Francisco.
Hoffman, Mrs. Mary L., San Francisco.
Barr, Miss Sara A., San Francisco.
Sumner, J. H., Alameda County.
Wheelock, Mrs. D. B., Alameda County.
Campbell, F. M , Alameda County.
Hamilton, Miss Addie, Alameda County.
Temple, Miss Emma, Alameda County.
Eickhoff, J. H., Sacramento County.
Shipley, J. C., Lake County.
Foster, Mrs. J. A., Santa Barbara Co.
Batchelder, H. T., Butte County.
Miller, Miss Ora E., Nevada County.
Hammond, Josiah Shaw, San Joaquin Co.
Hutton, Charles E., Sonoma County.
Otis, James, Sonoma County.
Morris, N. Z., Sonoma County.
Shearer, Mrs. C. C., Monterey County.
Stone, Mrs. B. H., Siskiyou County.
Overend, Miss Lizzie, San Francisco.

On motion of Professor Allen, the following resolution was adoptod:

Resolved, That all applications for life diplomas hereafter must he accompanied by a recommendation of the County Superintendent of the county in which the applicant resides.

A motion was made to revoke the life diploma of S. C. Stevens for unprofessional conduct.

On motion, the subject was referred to the State Board of Examination.

Superintendent Bolander, from the Committee on Course of Study, reported that since the last meeting of the Board he had consulted with many teachers and educators, and after a most careful consideration and re-examination, he could only report the course hack as heretofore adopted, with the statement that he had no amendments to offer. He could not improve upon it. Further consideration of the matter was postponed till the evening session, and on motion the Board adjourned to meet at 7 P. M.

EVENING SESSION.

The Board meet at 7 o'clock, Mr. Baker presiding.

The agent of Messrs. A. L. Bancroft & Co. appeared before the Board and reqnested the Board to adopt Hopkins' Manual of American Ideas for use in the public schools. Mr. Bolander said that he for one was pledged to oppose all change of text-hooks, and this while not a change, was the introduction of a new book. Mr. Baker expressed similar views.

The report of the Committee on Course of studios was received and the report adopted.

On motion of Superintendent Bolander, Smiths' *Teachers' Manual for Free-Hand Drawing in Primary Schools* for the use of teachers, was adopted.

The committee on the revision of the Rules and Regulations for the government of schools, reported; on motion the report was received, and the committee discharged.

After a careful consideration of the report, the following rules were adopted:

RULES AND REGULATIONS OF THE PUBLIC SCHOOLS OF CALIFORNIA.

SECTION 1. Teachers are required to be present at their respective school-rooms, and to open them for the admission of pupils, at *fifteen minutes before* the time prescribed for commencing school, and to observe punctually the hours for opening and closing school.

SEC. 2. Unless otherwise provided by special action of Trustees or Boards of Education, the daily school session shall commence at nine o'clock A. M., and close at four o'clock P. M., with an intermission at noon of one hour, from twelve M. to one o'clock P. M. There shall be allowed a recess of twenty minutes in the forenoon session—from ten forty to eleven o'clock, and a recess of twenty minutes in the afternoon session—from two forty to three o'clock. When boys and girls are allowed separate recesses, fifteen minutes shall he allowed for each recess.

SEC. 3. In graded primary schools in which the average age of the pupils is eight years, the daily sessions shall not exceed four hours a day, exclusive of the intermission at noon, and inclusive of the recesses. If such schools are opened at nine o'clock A. M., they shall be closed at two o'clock, P. M. In ungraded schools all children under eight years of age shall be either dismissed *after a four hours' session*, or allowed recesses for play, of such length that the actual confinement in the school-room shall not exceed *three hours and a half*.

SEC. 4. No pupil shall be detained in school during the intermission at noon, and a pupil detained at any recess shall be permitted to go out immediately thereafter. All pupils, except those detained for punishment, *shall be required* to pass out of the school-rooms at recess, unless it would occasion an exposure of health.

SEC. 5. Principals shall be held responsible for the general management and discipline of their schools, and the studies pursued; and the assistant teachers shall follow their directions, and co-operate with them, not only during school hours, but during the time when the pupils are on the school premises, before and after school, and during recesses. Assistants shall be held responsible for the studies, order, and discipline of their own rooms, under the general direction of the principals.

SEC. 6. Teachers are particularly enjoined to devote their time faithfully to a vigilant and watchful care over the conduct and habits of the pupils *during the time for relaxation and play*, before and after school, and *during the recesses*, both in the school buildings and on the playgrounds.

SEC. 7. It is expected that teachers will exercise a general inspection over the conduct of scholars going to and returning from school. They shall exert their influence to prevent all quarreling and disagreement, all rude and noisy behavior in the streets, all vulgar and profane language, all improper games, and all disrespect to citizens and strangers.

SEC. 8. Teachers shall prescribe such rules for the use of yards, basements and out-buildings connected with the school-houses as shall insure their being kept in a neat and proper condition, and *shall examine them* as often as may be necessary for such purpose. Teachers *shall be held responsible* for any want *of neatness or cleanliness* about their school premises.

SEC. 9. Teachers shall give vigilant attention to the *ventilation* and *temperature* of their school-rooms. At each recess the windows and doors shall be opened for the purpose of changing the atmosphere of the room. Teachers are required to exercise reasonable supervision over the text books of the pupil, to inspect the same from time to time, and prevent their defacement or wanton destruction.

SEC. 10. Teachers shall enter in the School Register, in the order of their application, the names of all those applying for admission to the school after the prescribed number of pupils has been received. Such applicants shall be admitted to seats, whenever a vacancy occurs in any class for which they have been found duly qualified, in the order of their registration.

SEC. 11. Teachers are authorized *to require excuses* from the parents or guardians of pupils, either in person or by written note, in all cases of *absence* or *tardiness*, or of dismissal before the close of school.

SEC. 12. No pupil shall be allowed to retain connection with any public school, *unless furnished with books, slate, and other utensils*, required to be used in the class to which he belongs; *provided*, that no pupil shall be excluded for such cause, unless the parent or guardian shall have been furnished by the teacher with a list of books or articles needed, and one week shall have elapsed after such notice without the pupil's obtaining said books. Books may be furnished to indigent children by the Trustees, at the expense of the district, whenever the teacher shall have *certified in writing* that the pupil applying is unable to purchase such books.

SEC. 13. Any pupil who shall in any way cut or otherwise injure any school-house, or injure any fences, trees or out-buildings, belonging to any of the school estates, or shall write any profane or obscene language, or make any obscene pictures or characters on the school premises, shall be liable to suspension, expulsion or other punishment, according to the nature of the offense. The *teacher may suspend* a pupil temporarily for such offense, and *shall notify* the Trustees of said action. Pupils shall not be allowed to remain in any of the rooms that are provided with improved styles of furniture, except in the presence of a teacher or a monitor, who is made especially responsible for the care of the seats and desks. All damages done to school property by any of the pupils shall be repaired at the expense of the party committing the trespass. Within one week of any damage to school property, teachers shall notify the Trustees, or be held personally responsible.

SEC. 14 All pupils who go to school without proper attention having been given to personal cleanliness or neatness of dress, shall be sent home, to be properly prepared for school, or shall he required to prepare themselves for the school-room hefore entering. Every school-room *shall be provided* with a wash basin, soap and towels.

SEC. 15. No pupils affected with any *contagious disease* shall be allowed to remain in any of the public schools.

SEC. 16. The hooks used and the studies pursued shall be *such, and such only*, as may he authorized by tho State Board of Eduction; and no teacher shall require or advise any of the pupils to purchase for use in the schools any hook not contained in the list of books directed and authorized to be used in the schools.

SEC. 17. It shall be the duty of the teachers of the schools to read to tho pupils, from time to time, so much of the school regulations as apply to them, that they may have a clear understanding of the rules hy which they are governed.

SEC. 18. In all primary schools, exercises in free calisthenics and vocal and *breathing exercises* shall be given at least twice a day, and for a time not less than from three to five minutes for each exercise.

SEC. 19. The following supplies shall be provided by tbo District Clerk, under the provisions of Section 1651 of the Political Code, on the written requisition of the teacher, viz: clocks, brooms, dusting brushes, wash basins, water buckets, tin cups, dust pans, matches, ink, ink bottles, pens, pen holders, pencils, crayon chalk, writing and drawing paper, hand hells, coal buckets or wood boxes, shovels, pokers, *soap*, towels, thermometers, door mats, and scrapers.

SEC. 20. Trustees are required to employ a suitablo person to sweep and take care of the school-house, and they shall make suitable provision for supplying the school with water.

SEC. 21. It shall be the duty of teachers to report to the County Superintendent the hooks used in their schools, togother with the number of pupils in the several divisions of each grade. This report must be mado at the beginning and close of each school session or year.

SEC. 22. The District Clerk, at the close of each term of school, or whenever a teacher is discharged, shall certify on the back of the order for tho *last month's* salary that the State School Register has been properly kept.

At 9:15 P. M. the Board adjourned.

HENRY N. BOLANDER, Secretary.

CONTEMPLATED LEGISLATION IN SCHOOL MATTERS.

The Senate Committee on Education consists of Finney, of San Mateo, Irwin, of Siskiyou, Tuttle, of Sonoma, Dyer, of Calaveras, and Gibbons, of Alameda.

The Assembly Committee on Education consists of Highby, of Los Angeles, Stower, of Alpine and Amador, Cowdery, of San Francisco, Clark, of Butte, Peck, of Calaveras, Gurnett, of Alameda, and Hurlburt, of Humboldt.

Mr. Cowdery has introduced a bill repealing sections 1669, 1670 and 1671; amending section 1662 so as to read as follows:

Every school must be open for the admission of all children of citizens of the United States and of the children of those who have declared their intention to become citizens, between five and twenty-one years of age, residing in the district, and the Board of Trustees or Board of Education has power to admit adults and children not residing in the district whenever good reasons exist therefor.

Section 1665 is amended by the addition to tho end of the section of "and in the first and second grades some suitable work on the political system of the United States."

A hill has been introduced to amend section 1874 so as to read as follows; "Any books adopted as part of a uniform series, must be continued in use for not less than eight years."

Two bills have been introduced to repeal sections 1726 to 1731, both inclusive.

Notice has been given of a bill to repeal section 1542.

Mr. Finney, of San Mateo, has introduced the following bill "To Enforce the Education of Children:"

AN ACT TO ENFORCE THE EDUCATION OF CHILDREN.

The people of the State of California, represented in Senate and Assembly, do enact as follows:

SECTION 1. Every parent, guardian, or other person in the State of California, having control and charge of any child or children, between the ages of seven and seventeen years, shall be required to send any such child or children to a public school for a period of at least two thirds of the time during which a public school shall be taught in each city, or city and county, or school district, in each school year, commencing on the first day of July, in the year of our Lord one thousand eight hundred and seventy-four, at least twelve weeks of which shall be consecutive, unless such child or children shall be excused from such attendance by the Board of Education of the city, or city and county, or of the Trustees of the school district in which such parents, guardians, or other persons reside, upon its being shown to their satisfaction that his or her bodily or mental condition has been such as to prevent attendance at school, or application to study, for the period required, or that such child or children are taught in a private school, or at home, in such branches as are usually taught in the primary schools of this State, or have already acquired a good knowledge of such branches; *provided*, in case a public school shall not be taught for three months during the year, within one mile, by the nearest traveled road, of the residence of any person within the school district, he shall not be liable to the provisions of this Act.

SEC. 2. It shall be the duty of the President of each Board of Education, and of the Clerk of each Board of District Trustees, in the State of California, to cause to be posted three notices of this law in the most public places in the city, or city and county, or in the school district, or published in one newspaper therein for three weeks in the month of June, in each year, the expense of each publication to be paid out of the school funds of such city, or city and county, or school district, as the case may require.

SEC. 3. In case any parent, guardian, or other person shall fail to comply with the provisions of this Act, said parent, guardian, or other person shall be deemed guilty of a misdemeanor, and shall be liable to a fine of not more than twenty dollars ($20); and for the second and each subsequent offense the fine shall not be less than twenty dollars ($20), nor more than fifty dollars ($50); and the parent, guardian, or other person, so convicted, shall pay all costs. Each such fine shall be paid to the Clerk of the proper Board of Education, or of the District Trustees.

SEC. 4 And it shall be the duty of the Clerk of each Board of Education, and of each Board of District Trustees, on complaint of any teacher or taxpayer, to prosecute all offenses occurring under the provision of this Act; and any Clerk neglecting to prosecute such offense within ten (10) days after a written notice has been served on him by any teacher or taxpaper within the limits of the authority of said Board, unless the person so complained of shall be excused by the proper School Board, shall himself be liable to a fine of not less than twenty ($20) dollars, nor more than fifty ($50) dollars; which fine shall be prosecuted for and in the name of The People of the State of California, and the fine so collected shall be paid over to the Clerk of the Board of Education or Trustees of the proper city, or city and county, or school district, to be accounted for as in section three of this Act; and in case such prosecution fail, the expenses thereof shall be paid out of the School Fund of the city, or city and county, or school district in which the case arose.

SEC. 5. And it shall be the duty of the Census Marshal to furnish each Board of Education, and of District Trustees, with a complete list of all children living within the jurisdiction of said Board, and to note on such lists all children not attending colleges, college schools, private schools, or being taught at home, who are liable to the provisions of this Act; and each teacher teaching within the limits of the jurisdiction of such Board, shall be supplied with a list of all children within his or her department or school, and shall call such list each morning on the opening of school, and note the absentees, and the reason of such absence, if any, and at the close of each term of twelve weeks shall make a full report to the Board of Education, or of District Trustees, of all such cases of absence, with the names, both of children and parents, guardians, or other persons having such children in charge; and said

Board shall thereupon forthwith proceed to prosecute such parents, guardians, or other persons, according to the provisions of this Act.

SEC. 6. And, *whereas*, the State has provided an institution for the gratuitous instruction of all resident deaf and dumb, or blind children, between the ages of six and twenty-one years, every parent or guardian of any child or children afflicted with deafness or blindness, shall be required, under the penalties hereinbefore specified, to send such child or children to said institution for a period of not less than five consecutive years, unless such child or children shall have been excused by the authorities, and on the grounds specified in section one of this Act.

SEC. 7. And the Board of Education of each city, or city and county, and the Board of Trustees of each school district, in this State, shall have power to appoint a Board of School Inspectors, of one or more persons, for each such city, or city and county, or school district, who shall perform such duties in the inspection of all public and private schools within the jurisdiction of said Board, as the interests of education may seem to require, and to require of said Inspectors such reports of the condition of said schools as may be necessary to a full and complete knowledge of the methods, thoroughness, and extent of instruction given in said schools. The Board of Education in any city containing not less than twenty thousand inhabitants, shall have power, in its discretion, to appoint one or more persons who shall be called "Truant Officers," who may be removed at the pleasure of the Board, and whose duty it shall be to report the names of all persons who shall neglect to comply with the provisions of this Act, to any Justice of the Peace, or Police Judge, and shall assist in the prosecution of such persons. He shall also report to the parents or guardians of any child, any neglect or refusal of any child to attend any public or common school upon which such child shall have been in attendance, either when such neglect or refusal is of his own knowledge, or when requested so to do by the teacher of such school.

SEC. 8. Any Justice of the Peace of the proper city, or city and county, or school district, shall have jurisdiction of all offenses committed under the provisions of this Act.

SEC. 9. This Act shall be in force and effect from and after the first day of July, eighteen hundred and seventy-four.

IN ORDER to bring the High Schools into their proper relation with the State University, the Board of Regents appointed a committee to devise a system of High Schools for this State. Said committee have prepared the following bill, which will be introduced into the Legislature on an early day:

High Schools shall be of two classes, those which provide one, and those which provide two courses of study. If only one course is provided, it shall be the first course.

The first or modern course of study shall fit scholars for business or for the scientific departments of the State University, and shall give instruction in Algebra, Geometry, Higher Arithmetic, Bookkeeping, History, English Composition and Drawing. It is recommended that instruction be also given in French or German, and that the study of nature be begun by the study of the plants, trees, animals, rocks, climate and other natural characteristics of the region in which the school is established.

The second or classical course shall include the mathematics of the first course, and so much of Latin and Greek as is required for admission to the classical department of the State University.

BOOK NOTICES.

PRONOUNCING HAND-BOOK OF WORDS OFTEN MISPRONOUNCED, AND OF WORDS TO WHICH A CHOICE OF PRONUNCIATION IS ALLOWED. By Richard Soule and Louis J. Campbell. Boston: Lee & Shepard. Sacramento: A. S. Hopkins.

The purpose of this work is to give the current usage of the best speakers with regard to such words as are the most liable to be mispronounced, and also to such words as may be pronounced in either of two ways without any offense to good taste. In the

latter case, the pronunciation which is supported by the greater weight of authority, and is the more generally accepted is put first in order. Several pages are devoted to a discussion of certain sounds in regard to which there is a difference of opinion among orthoepists. Quite a number of much needed cautions are given against some common errors in pronunciation.

This Hand-book gives thus in a convenient compass much valuable information which is of daily use to the teachers and pupils of our schools.

SEX IN EDUCATION; OR, A FAIR CHANCE FOR THE GIRLS. By Edward Clarke, M. D. Boston: James R. Osgood & Co. San Francisco: A. Roman & Co.

It is an unquestionable fact, that the health of American women has on the average distinctly deteriorated during the past forty years. The delicate beauty of American girls quickly fades; the diseases peculiar to women are commonor than they used to be, and women of tho educated classes are less able than formerly to bear and nurse children. The medical profession testifies with singular unanimity to this sad truth, common observation corroborates their testimony, and the census adds its statistics to complete the unwelcome demonstration. Moreover, the sterilizing influences, whatever they are, undoubtedly affect the refined classes more strongly than the ignorant and rude. The women who are morally and mentally best fitted to perpetuate and improve the race are precisely those who are physically least likely to do so. It is imperative that the American community should be awakened to the gravity of this danger, and be instructed in the means of avoiding it.

Dr. Clarke's book is a strong presentation of *one* of the chief causes of the evil. A rigorous climate, an unwholesome diet, foolish clothing, indoor life, and the unseasonable excitements of society, all contribute to the disastrous result; but Dr. Clarke, while recognizing the influence of all these causes, purposely confines himself to a discussion of a cause of weakness and suffering in women which is more universal, fundamental, and potent than any other. This cause is the prevalent neglect during girlhood, both at home and at school, or at work, of the most delicate and characteristic part of woman's organization.

Dr. Clarke's argument may be abridged somewhat as follows, though not without doing it injustice: The periodical movements which characterize woman's structure for more than half her life are fountains of power, not hindrances or signs of inferiority; no woman can be symmetrically and completely developed in *any* part of her organization—body, mind, or soul—in whom theso most essential and characteristic parts of her struoture have been stifled or aborted by neglect. To insure the healthy development of the wonderfully intricate reproductive system in the woman, it is essential that the girl should always have a remission and sometimes an intermission of labor, study, exercise, and exoitement during a part of every fourth week, from about the fourteenth to about the nineteenth year of hor life. The amount of the remission, or the length of the intermission, varies with different individuals; but comparative rest, or diminished activity, is a physiological necessity for all girls, however robust they may seem to be. Activity of brain at the period which should be given to rest and repair is quite as dangerous as activity of body. Disproportionate brain-activity exerts a sterilizing influence upon both sexes, but this influence is more potent upon the female than upon the male. The penalties for violating these physiological laws are terribly severe. Headache, neuralgia, hysteria, and a monthly torture which makes life miserable are among the commoner forms of punishment. Barrenness is the extreme penalty. When the evil does not go so far as this

it is, nevertheless, dreadful enough. The influence of her reproductive system upon the character of woman is strong and deep. When one member suffers, all the other members suffer with it. "A woman, whether married or unmarried, whether called to the offices of maternity or relieved from them, who has been defrauded by her education or otherwise of such an essential part of her development, is not so much of a woman intellectually and morally, as well as physically, in consequence of this defect." (p. 91.)

Having explained the physiological principles and rules which are involved in this discussion, Dr. Clarke proceeds to illustrate them by actual cases of a typical sort which have occurred in his own practice. The record of these cases is sad reading, but no one can fail to recognize the truthfulness of the descriptions, and almost every one will be able to match them within the range of his own observation. They are so lifelike, or, rather, deathlike, that they will convince anybody whose mind is open that there is great danger in stimulating girls and young women to unremitted mental or bodily activity, and keeping them constantly in a state of intellectual and emotional tension during the period of sexual development. This period coincides with the ordinary period of school life of an American girl, and hence all the methods and processes of schools for girls should be devised with express reference to the periodicity of the female organization.

Instead of this requisite adaptation to the needs of girlhood, Dr. Clarke finds that our methods of educating girls do not give the female organization a fair chance, but, on the contrary, that they check development and invite weakness. The schools for girls have been modeled after schools for boys, and have imposed upon their pupils a boy's regimen, apparently upon the theory that a girl, like a boy, develops health and strength, blood and nerve, intellect and life, by a regular, uninterrupted and sustained course of work. It is against this fatal theory that Dr. Clarke protests with all the weight of his learning and experience. He maintains (p. 126) that "girls lose health, strength, blood, and nerve by a regimen that ignores the periodical tides and reproductive apparatus of their organization." Here is the fundamental reason for separating boys and girls in educating them, as soon as the age of puberty is reached. The methods which are safe and judicious for one sex are unsafe for the other. The stimulus which is harmless and even essential for boys is altogether unnecessary and harmful for girls. What Dr. Clarke thinks of identical coëducation for the two sexes may be inferred from the following forcible passages (pp. 135–136):

"Put a boy and girl together upon the same course of study, with the same lofty ideal before them, and hold up to their eyes the daily incitements of comparative progress, and there will be awakened within them a stimulus unknown before, and that separate study does not excite. * * The first sex to suffer in this exhilarating and costly competition must be, as experience shows it is, the one that has the largest amount of force in readiness for immediate call; and this is the female sex. At the age of development, nature mobilizes the forces of a girl's organization for the purpose of establishing a function that shall endure for a generation, and for constructing an apparatus that shall cradle and nurse a race. These mobilized forces, which at the technical educational period, the girl possesses and controls largely in excess of the boy, under the passionate stimulus of identical coëducation are turned from their divinely appointed field of operations to the region of brain-activity. The result is a most brilliant show of cerebral pyrotechnics, and the degenerations that we have described."

Dr. Clarke's book should be carefully studied by every teacher of girls, and by every trustee or committeeman who has a voice in the management of a girls' school; but it will not do all the good it is capable of doing unless it is also widely read by

American mothers. The physiological laws which Dr. Clarke has expounded are, to be sure, constantly violated in the schools and colleges to which girls resort; but they are also violated quite as dangerously in the homes from which the girls come, and as often in more pleasure-seeking as in study or other serious labor. American mothers seem to often not to exercise a due control over their daughters at the catemenial period. They sin in this way, sometimes from dense ignorance, sometimes from a reckless inclination to grant their daughters present pleasure, at whatever risk of future pain, and sometimes from an entire lack of effective control over their children. Near the end of Dr. Clarke's treatise is an admirable letter from a German lady about the course which German mothers adopt with their daughters at the catamenial period. It is so compendious and practical a bit of advice that we quote the principal passages (p. 175):

"As soon as a girl attains maturity in this respect, which is seldom before the age of sixteen, she is ordered to observe complete rest; not only rest of body, but rest of mind. Many mothers oblige their daughters to remain in bed for three days, if they are at all delicate in health; but even those who are physically very strong are obliged to abstain from study, to remain in their rooms for three days, and keep perfectly quiet. During the whole of each period they are not allowed to run, walk much, ride, skate, or dance. In fact, entire repose is strictly enforced in every well-regulated household and school. A German girl would consider the idea of going to a party at such times as simply preposterous; and the difference that exists in this respect in America is wholly unintelligible to them. As a general rule, a married woman in Germany, even after she has had many children, is as strong and healthy, if not more so, than when she was a girl. In America, with a few exceptions, it appears to be the reverse; and I have no doubt it is owing to the want of care on the part of the girls at this particular time, and to the neglect of their mothers to enforce proper rules in this most important matter."

Some of the people who are already professionally committed as journalists, teachers, or philanthropists to dangerous experiments in female education, experiments costly in life and health if not in money, will doubtless attempt to prevent the circulation of Dr. Clarke's book by denouncing it as indecent or coarse. Those who know Dr. Clarke's character and standing will not need any denial of such a charge; but for the benefit of those who have never before heard of Dr. Clarke, it is proper to say that the book is simply plain-spoken. There are a few jocose remarks in it which are unpleasing in connection with so grave a subject, and the author's aversion to masculine women has betrayed him into the use of a few repulsive, and perhaps unfeeling phrases; but these are trifling blemishes in comparison with the great merits of frankness, clearness, and earnest sincerity. The subject has long needed some plain-speaking by a competent authority. Dr. Clarke is emphatically a trustworthy authority. He was for many years a professor in the Medical School of Harvard University, and is now, by the choice of the alumni, one of the overseers of the university. The fact that he is a general practitioner and not a specialist only adds to the weight of his opinions. A specialist easily comes to think that the whole world is afflicted with the diseases which he treats. No member of the medical profession in Boston stands higher than Dr. Clarke in public estimation, whether as regards scientific attainments, professional skill, or practical sagacity. To question his authority is as useless as to decry his character. Moreover all the eminent physiologists of the world are on his side.

The terrible evil to the cure of which Dr. Clarke hopes to contribute through the teachings of this book presses nearly as heavily upon men as upon women; for in the first place all males as well as females must be born of woman, and inherit in one form or another the weakness of the mother, and in the next place the happiness and

welfare of most men are bound up with the health and happiness of their wives and children. It is a great consolation and encouragement to believe with Dr. Clarke and many other physiologists that the evil, when once apprehended and vigorously combatted on true physiological principles, is curable in two or three generations, and the publication of this treatise is in itself an indication that the process of improvement has already begun.—*The Nation.*

THE CHILD, ITS NATURE AND RELATION: AN ELUCIDATION OF FROEBEL'S PRINCIPLES OF EDUCATION. A free rendering of the German of the Baroness Marenholtz-Bülow. By Matilda H. Kriege. New York: E. Steiger; San Francisco: A. Roman & Co.

KINDERGARTEN CULTURE IN THE FAMILY AND KINDERGARTEN; A Complete Sketch of Froebel's System of Early Education, adapted to American Institutions. For the Use of Mothers and Teachers. By W. N. Hailman. With 12 plates. Cincinnati and New York: Wilson, Hinkle & Co.

Thanks to the earnest labors of Miss Peabody, Dr. Donai, Mrs. Kriege, and others, a knowledge of Kindergarten Culture has been more or less extensively diffused, and the system introduced into America. It is interesting to note that whatever success Froebel's system has met with is due principally, almost wholly, to the personal efforts of devoted women. Much of the heritage left us by Froebel would have been lost, or lain idle for years, had it not been for the indomitable energy of the Baroness Warenholtz-Bülow, who devoted herself to the continuation of Froebel's work. It would be more just to say, not to the continuation of his work, but to the perfection of his work. Froebel himself was not happy in the expression of his thoughts in writing; his meaning is too often obscure or hidden. It needed the intuition and tact of a woman, of a mother, to perfect Froebel's works and teachings. So valuable have the Baroness' services been, that a French author, M. Guyard, wrote to her in 1857, when she was in Paris, that Froebel had found in her "what all philosophers need, that is, a woman who understands him, who clothes him with flesh and blood, and makes him alive. I think, I *believe* indeed, that an idea, in order to bear fruit, must have a father and a *mother*. Hitherto ideas have had fathers only. As Froebel's ideas are so likely to find mothers, they will have an immense success. When the ideas of the future shall have become alive in devoted women, the face of the world will be changed."

Mrs. Kriege has had several years experience in the Kindergarten system; she has exemplified Froebel's method in a Kindergarten, has trained teachers to spread the system, and has specially succeeded in gaining, in Miss E. P. Peabody, an enthusiastic and devoted friend to the cause, who by lectures and writings has awakened in our country a deep interest in the system.

Mrs. Kriege modestly styles her book "a free rendering of the German of the Baroness Marenholtz-Bülow." But a higher office has been hers; she has filled the place in American education which is so fittingly occupied by the Baroness in European education. Instead of introducing Froebel's system first through writings, she followed the wiser course of first exemplifying the system; and thus she has fitted herself more fully to be the American exponent of the new education, and to present it in a manner best adapted to American mind and mode of thought. Being a personal friend and disciple of the Baroness, as the latter was of Froebel, she is imbued with the beauty and real importance of the new education as thoroughly as the master was; but she enjoys this advantage over him, that experience has enabled her to correct many of the errors into which he was led.

Mrs. Kriege's book confines itself to the immediate writings of Froebel and the

Baroness Marenholtz. Mr. Hailman's book takes a wider range. He not only presents a concise view of the entire system, but he presents it in such a form "that the connection between it and other important educational factors may stand out prominently, and that mothers and teachers may, at the same time, find enough practical suggestions to enable them to test the merits of the system without injury to the little ones." He therefore looks for his material outside of as well as to the immediate disciples of Froebel. In the second place, Mr. Hailman has another object constantly in view, in fact makes it the prominent feature to present "an attempt to adapt the system of Froebel to the wants and peculiarities of our own schools, omitting some features that seemed foreign to the spirit of our institutions, and modifying others in accordance with these institutions, as they appear to him."

Mrs. Kriege, in determining the aim of the new education, summarizes the shortcomings of the present education in the question: "Have the best of our schools, while imparting a knowledge of what is good, just, noble, beautiful and elevated, sufficient to satisfy the demands of a higher morality, also imparted the power to realize in life that which has been recognized in principle?" and she extracts from the present condition of society an emphatic No. And in her eyes as in Froebel's, the solution of the problem proposed to the new education, "is dependent on the harmonious development of all powers and talents, and in each stage of development it is essential that the degree of intelligence attained be balanced by the degree of morality expressed in life and action. To establish the equilibrium between intelligence and moral power as evinced in the natural life, is in a great measure, if not solely, the task that education has now to attempt. The school alone is unable to accomplish it, because it takes into account almost exclusively the intellect, and merely imparts knowledge. * * * The school must assume a part of the work, but only a part, by enlarging its sphere, by incorporating fresh life-elements. As all the activities of life make use of, or take advantage of the discoveries in every branch of science, so the school must include the activities of real life, in order to prepare its pupils to combine theory and practice, thinking and doing. It should no longer be merely a place in which to acquire learning, it ought no longer to teach sciences apart from their application to life, but should prepare the young for the practical every day work of their existence. Above all, it ought to give its pupils opportunity for the exercise of *moral powers*. For this, free activity is requisite; only a *free* choice of the true and good gives to our actions the stamp of a higher morality. The study of historical examples, of elevated thoughts, of noble deeds, does not suffice for a truly moral education; we must furnish a field of action, in which our youth can exercise themselves in noble and generous deeds. Besides this, they need conditions favorable to the acquisition of *good habits*, as a basis for all virtues. No one can become a master in any great art by merely committing its theories to memory. Education must furnish more than verbal instruction. * * * Mere verbal instruction is, of course, easier for teacher and pupil, but therefore hurtful to the latter. He gets used to a mere reception of facts into the memory, without thinking or investigating for himself. But healthy, normal development proceeds differently. The young mind can receive properly only a very limited amount of instruction, can only slowly assimilate and make it its own. It at first only truly receives that which is presented in a tangible, a concrete form. But even in the contemplation of the concrete, of the object, it depends upon the organization of the pupil, whether by his own mind he gains a clear mental image which will make a lasting impression and be wrought into a perception, or whether the image is vague, the impression transient,

and so the perception wanting. The young mind feels, moreover, a desire to reproduce the images and perceptions it has acquired; to embody them in an external, concrete form, in order to make them more definite and clear to itself. This strongly defined need of child's nature is suppressed by the more verbal instruction that comes too early, to load the mind, through the memory, with a burden of facts, weakening and destroying its higher faculties. * * * For the supply of conditions favorable to true development, the child is dependent upon the two mighty agents of education, the family and the school. As yet, both fail to give what is required. Education in the family is left to chance, or is dependent on the natural capability and fitness of the parents, the best of whom have no sure guide in their work, and the greater part of whom deal thoughtlessly and arbitrarily with their children. The school, on the other hand, offers only the means for intellectual growth, and cannot therefore act directly on the moral faculties. It lacks means for promoting free activity, for calling forth the ideal in productions of beauty, and for exercising the full powers of the pupils, without which neither the moral faculties nor the individual vocation can be developed and strengthened."

Mr. Hailman, in considering the aim of the new education, approaches the question from its philosophical or rather pedagogical side, and chooses for this the historical method. Nothing original is offered; in fact, stopping short in pedagogical psychology with the views of Horhart and Beneke, he has given us not even the latest phases of the subject, as enounced, for instance, by Ditters, who, by the by, not only severely criticises but proves the incorrectness of much of what Herbart and Beneke have written.

The difference in the method of presenting to the American public the object and plan of Kindergarten culture, observable in the first chapter of the respective books, is continued throughout the works. Mrs. Kriege, following in Froebel's footsteps, lays the greatest stress upon the religious or rather moral side of education, and confines herself principally to the part to be borne by the mother and the family, and finally by the Kindergarten, as a connecting link between the family and the school, in the education of the child. Mr. Hailman never loses sight of his object, of adapting this system to the wants of our public schools. In promotion of this, he critically examines the different gifts as introduced by Froebel, object lessons, etc., and shows their adaptation to the real work of the school.

Mrs. Kriege's book appeals most to mothers; Mr. Hailman's most to teachers. Mr. Hailman systematizes and places on a pedagogical basis what Mrs. Kriege presents to mothers as the aim and needs of education. One book complements the other. Both are indispensable to mothers who desire to prepare themselves for an intelligent discharge of the sacred duties placed in their hands by our Heavenly Father. Both books are indispensable to the teacher, especially the primary teacher. To all interested in education we commend these books, and bespeak for them a careful and thorough perusal.

THE PHILOSOPHY OF NATURAL HISTORY. By John Ware, M. D. Boston: Thompson, Brown & Co. 1873.

We have been frequently asked to recommend a book on Natural History. We unhesitatingly recommend the above work. The object of the book is not to teach Natural History, technically speaking, but to present such views of it as would be intelligible to the young student and to the general reader, and prepare them for and lead them to engage in, a more extended study of the subject, as it is presented in treatises more strictly scientific.

The first ten chapters of the book form an introduction to the Philosophy of Natural History. In these introductory chapters is given whatever can be of interest to the general reador or student, not claiming to be a naturalist, regarding the characteristics and structure of the animal kingdom, from man to animalcules.

Then follows the Philosophy of Natural History, which is nothing but a well and

popularly written account of Comparative Physiology, to which are added some accounts of the distribution, covering, migration, hybernation, habitations, artifices, and variations of animals. The book is admirably adapted to the present wants of our teachers, who are now required to teach Natural History.

Outlines of German Literature. By Joseph Gostwick and Robert Harrison. New York: Henry Holt & Co.

The scope of the above work is indicated by its title. It *outlines* the literature of the German people from earliest to latest times, from 380 A. D. to 1870. The work is not critical, but rather narrative and descriptive. In case of the more important authors, a brief sketch of their lives and extracts from some of their writings, are given. The systems of philosophers and theologians are briefly elucidated.

The authors divide German literature into seven periods:

"During the *first* period, literature was the servant of the Church, and was employed by the monks at St. Gallen and at Fulda for the culture of the people. In the *second* period the language was made musical, poetry prevailed over prose, and royal and baronial halls in Austria and Suabia welcomed the knights and minstrels who cultivated poetry and music. The *third* period was the time when literature, neglected by the nobility, found shelter—strange to say!—in the club-rooms of the guilds (or trades-unions), where co-operative master-singers kept their stores of home-made verse. Prose at that time was better cared for by the mystics at Strasshurg, and poetry, in the form of prose, might be found in the friar Berthold's sermons addressed to congregations assembled in the open field. In the *fourth* period, Luther gave his German Bible to the people, and thus laid the foundation of a national literature; but the work of building up was soon interrupted by controversy, and by the disastrous Thirty Years' War. Its miseries supply more than sufficient excuse for the wretched literature of the *fifth* period. Then followed a time when a great improvement of style was introduced by the writings of the popular philosophers, and when Lessing appeared as the herald of a new literature. It is impossible to characterize thus briefly the literary work of the *seventh* period, or of the hundred years 1770–1870. The three chief tendencies that have ruled during this time have been the classical, in the days of Goethe and Schiller, the romantic or mediæval, introduced by the Schlegels, and the realistic, which is prevalent in our own time."

The work is a valuable addition to our compendiums of literature, and should find a place in every library.

Vick's Floral Guide for 1874.

The January number of this popular catalogue contains a full page colored illustration of the double portulaca. Within the one hundred and thirty-six pages of the *Guide* is given a vast amount of information in regard to flowers and vegetables and their culture, besides some sensible suggestions concerning floral decorations for home and church, boquet making, rockeries, etc.

The *Guide* is now published quarterly at twenty-five cents a year. Send for it, all ye lovers of flowers.

The Overland Monthly for January, 1874.

This is not only a holiday number and the first number of a new (the twelfth) volume, but also the first number of the new literary management of Mr. Avery. Of the seventeen original papers, "Stony Bar Store and its Customers" by Prentice Mulford, "Pepita," "It Happened in Fifty-six," faithfully picture the unique life and character of California; No. 1 of "Summering in the Sierra" by the editor, is full of scenical charms; Stephen Powers continues his description of "The California Indians," the Neeshenams being his subject for this month; Professor Davidson contributes "Abrasions of the North-Western Coast;" Joaquin Miller is represented by a prose sketch entitled "The River Rhine." The poetry and the pieces of prose not mentioned are of sustained excellence. The editorials comprise pleasant gossip about the holiday season, a review of the labor of the Geological Survey, scientific notes, a few words regarding the Yosemite Park, and California Photographs in Vienna, a fitting tribute to the late Professor Agassiz, and full and admirably written Art Notes and Book Notices.

The excellent literary contents are presented in an attractive illuminated cover.

NEW BOOKS.

***Kindergarten Culture** in the Family and Kindergarten.—(Just Published.)* By W. N. HAILMAN, A. M. A complete sketch of Froebel's system of Early Education, adapted to American Institutions. For the use of Mothers and Teachers. 12mo. 120 pp., cloth. Illustrated. Price 75 cents.

Ray's Surveying and Navigation:—(Just Published.)

With a Preliminary Treatise on Trigonometry and Mensuration. By A. SCHUYLER, A. M., Professor of Applied Mathematics and Logic in Baldwin University; Author of "Higher Arithmetic," "Principles of Logic," and "Complete Algebra." 8vo., sheep, 403 pp. Price, $2.25: for introduction, $1.50; sample copy by mail, $1.75.

The School Stage:

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[*For the California Teacher.*]

ON THE PHYSICAL GEOGRAPHY OF CALIFORNIA.

BY J. D. WHITNEY.

ARTICLE I—PRELIMINARY.

California offers to the man of science and the teacher a wonderful variety of interesting problems in its geographical, geological and climatological relations. The problems which are here presented have been seriously attacked only by the State Geological Survey or under its auspices, and while much has been accomplished, that which remains to be done is so vast in amount that it seems as if a beginning had hardly been made towards presenting a clear picture of the Pacific Coast in all its physical and geological relations.

The appearance of the State Map—the "Map of California and Nevada" on a scale of eighteen miles to an inch—just issued by the Geological Survey, seems to indicate that the present is a good time to set forth in a manner which will be intelligible to the teachers of the State some of the most important of the general results which have been obtained in working out during the past ten or twelve years, with very scanty and entirely insufficient means, some of the problems above indicated. Let us first, however, get some general idea of what had been accomplished by our predecessors.

California is a State second in size only to Texas. It is equal in area to a quarter of a hundred of Massachusetts; it has a single county as large as New York. Laid down on our eastern seaboard, it would reach from New York City to Florida. It is about twice as large as Great Britain. At the time of the commencement of the Geological Survey, with the exception of a fringe a mile wide worked out by the Coast Survey at a few points near the Bay of San Francisco, not a square mile of its area had been mapped with any, even the rudest, approach to accuracy. Whole regions as large as Switzerland embraced within its borders, were as unknown to geographic exploration as is now the interior of Africa; not one of the peaks of the Sierra Nevada had been measured; not a river of all those flowing down the slope of that mighty range traced to its source. It should not be forgotten that the Geological Survey has had to be the pioneer of geographical explorations, and allowances should be made accordingly. Compare the Alps of Central Europe with the Sierra Nevada, and they will be found but little superior in elevation, extent, or interest, to the Californian mountain range; but how immense appears the labor expended in Alpine scientific explorations, when compared with that which has been bestowed on the Sierra. Scores of professional geologists and hundreds of scientific tourists have penetrated into every nook and cranny of the Alps, and the mere catalogue of their publications would fill a large volume. More than this: Alpine clubs have been formed in almost all the States of Central Europe having for their object the scientific exploration of those glorious mountains, and the number of their members may be counted by the hundreds, each club publishing every year something of its results. All this in addition to the work done by the different Governments of countries having portions of the Alps embraced within their territories, work, both geological and topographical, minutely detailed and thoroughly accurate. The reader of these papers should take these things into consideration, and not expect more finish in the Geological Survey work done in California than can be legitimately asked for under the circumstances.

The development of the topography of the region west of the Mississippi, and especially of that lying to the west of the

one hundred and fifth meridian, which skirts the base of the Rocky Mountains on the east, has been going on during the past sixty years; but it is only within the past ten that the work has been seriously taken in hand.

Three hundred years ago, the line of the Pacific coast of North America had been roughly laid down by Spanish navigators, but up to the beginning of the present century, the vast interior region lying west of the one hundredth meridian remained almost entirely a blank on the maps. The best compilations at that time represented a single chain of mountains running caterpillar-like north and south through the continent from Mexico northwards; while to the west of this, sundry large lakes were laid down without any indication of the direction of their drainage. The compilation of all the materials accessible to Humboldt in 1811 into one map of the North American continent, which however reached only as far north as latitude 42, indicated two great ranges of mountains, one along the Pacific Coast, and the other about midway between that and the Mississippi. The course of the Colorado was laid down with some approach to accuracy, but north of that river there was nothing indicated except two large lakes, one called Timpanogos, the other "the Salt Lake," into the last named of which the river San Buenaventura was shown as running from the east. A group of mountains was also sketched in, somewhere near the center of what is now the State of Nevada, called the "Sierra de San Marcos."

The explorations of Lewis and Clarke, in the years 1804 to 1806, threw much light on the region about the heads of the Missouri and Columbia rivers and their main affluents, and the map furnished by these intrepid explorers showed clearly that the so-called Rocky Mountain chain was, in its northern extension, at least, a complex series of ranges; but all that region included in what is now popularly known as the "Great Basin," at present occupied by the States of Utah and Nevada, and also all of the interior of California, remained a blank on the map, or, rather, was filled up with imaginary details. As late as 1826, the territory in question was represented on various maps as traversed by great rivers running from east to west and heading in the Rocky Mountains. Two of these rivers,

the Los Mongos and the Timpanogos, were indicated as originating in the Timpanogos Lake of Humboldt, while his San Buenaventura was extended from Salt Lake to the Pacific, emptying into the Bay of San Francisco. Thus in twenty years no progress had been made in the development of the topography of the region between the Colorado and the Columbia, unless the obliteration of the Sierra Nevada, which was indicated on Humboldt's map, and by that name, can be called geographical progress.

The first rough approximation to a general outline of the geography of the Great Basin region was made by Captain B. L. E. Bonneville, who spent three years in its exploration, having received leave of absence from the United States Army for that purpose, with the express condition that the Government was to be "at no expense in reference to the proposed expedition," which seems to have been organized and paid for by the adventurous Mr. Hunter of the Far West. Bonneville's maps and journal were published in 1837, having been placed in the hands of Washington Irving for that purpose. These maps showed correctly the Buenaventura (now the Sacramento) river and the San Joaquin running parallel with the Pacific Coast; the Humboldt river, called on Bonneville's map the Mary, or Ogden, was also laid down in its proper position, while the existence of a closed basin between the Pacific and the Rocky Mountains without any outlet to the sea, was clearly established, and the Sierra Nevada restored to its true position, as indicated by Humboldt, but which had entirely disappeared from the maps since the time of his Mexican researches.

It is, indeed, surprising that Bonneville's important discoveries, made under such disadvantages, should have excited so little attention at the time of their publication. Evidently the public mind was not yet prepared to feel any lively interest in the geography of the farthest west. Even Fremont appears not to have had any acquaintance with Bonneville's work, although published under the auspices of so distinguished a writer as Washington Irving, and only five years before the former began his explorations. Fremont nowhere mentions Bonneville's name.

It is not necessary here to do more than allude to the labors

of Fremont in developing the geography of the Cordilleras, which labors were principally performed during the years 1842 to 1846. The results of these explorations, together with all the other information which could be obtained relating to the region west of the Mississippi river, were compiled into one general map in 1848 by Mr. Charles Preuss, Fremont's skillful topographer. On this map the general topographical features of California are distinctly outlined, but of course without any accuracy of detail. The main features brought out and, for the first time, clearly expressed, were: the existence of a range of mountains along the coast distinct from the Sierra and bounding the great valley on the west; the broad slope of the Sierra on its western side, as contrasted with its sudden fall to the eastward to the level of the Great Basin; the inosculation of the Coast Range with the Sierra at the northern and southern extremities of the Great Valley; the existence of parallel ranges of mountains with a trend a little east of north in Nevada, although no attempt was made to fix their position or number. The greatest error introduced into the map was the delineation of two east and west chains of mountains, limiting the Great Basin on the north and south; these were theoretically necessary in order to make a handsome border to the Basin, but they have no existence in reality.

San Francisco, December 15, 1873.

CIRCULATION OF WATERS ON SURFACE OF THE EARTH.

V.

On its long subterranean path, the water generally comes in contact with substances which it has power to melt. Even common spring-water is, for this reason, not so chemically pure as rain-water; and although it holds but a very small quantity of carbonate of lime in solution, it is still sufficient to form, in conjunction with soap, a flaky lime-soap, while in rain and river water the soap dissolves equally, and it prevents peas and beans becoming soft in boiling, for the lime adheres to the shells, and in this manner excludes the entrance of the water. Therefore we call spring water hard, in contrast with the soft river water. A spring becomes a mineral spring when the ingredients which it holds in solution exist in greater quantities.

Pliny has given us the key, so to say, to the fabrication of mineral springs; it is as follows: The waters partake of the nature of the country through which they flow. Starting from this dictum, Strowe investigated the basalts, phonolite, and porphyry in the vicinity of Bilin, Teplitz, Marienbad, Carlsbad, and Eger. After having discovered all the solid ingredients of the neighboring chalybeate spring, he proceeded to imitate them artificially, by bringing the pounded rocks in contact with carbonic acid gas and water, under the pressure of a pump. The brilliant results of these experiments are the artificial mineral waters, a blessing indeed, more especially for those regions remote from the healing springs.

Of all the mineral springs, the saline are of the most importance. The theory of lixiviation has been most clearly and satisfactorily proved in them; science having succeeded in directly tracing the birth-place of their saline ingredients, to the enormous beds of rocksalt. This important discovery, to which Prussia owes Wilitschka in Stassfust, was made by Hern von Langdorf, who with unwearied perseverance carried on his boring operation in Wimpfen, in Wirtemberg, from August, 1812, on to the spring of the year 1816; till at a depth of four hundred and seventy-five feet, he at length reached a bed of rock-salt sixty feet in thickness. This success provoked imitation in North and South Germany, and in France.

The carbonate of lime which so many springs hold in solution, leaves a firm deposit on the evaporation of the water. This evaporation produces in the limestone caves those wonderful stalactic formations we are all acquainted with. Just as icicles are formed in thaw-weather, so do limestone drops form on the roofs of those caves, from the calcareous sediment left after evaporation. These pendant formations are met by others rising from the ground, produced by the falling drops, till both meet in the shape of a sand-glass, but which the continual accumulation changes in time into fine slender columns. A more rapid evaporation takes place at one waterfall, the Lapis Tiburtinus of the ancients, now generally known in another form as the Confetti di Tivoli.

The Carlsbad spruddschale (thermal tuff) is a well known example of the stalactites of hot springs, every visitor bring-

ing away with him at least one petrified souvenir. Here, too, this deposit is a result of increased evaporation from the falling of the water. A fine instance is the Pambuk Kaleffi (the cotton castle), so called from the picturesque shapes of the calcareous deposit—the Hierapolis of the ancients, of which Strabo tells us, its waters solidified so rapidly that canals were transformed into walls made of one solid piece. These springs take their rise in large numbers in a table-land; now, as they themselves cast up ever new obstacles, they have to make their way in devious channels, till reaching a steep of three hundred feet, they fall over it for a reach of about half a mile. According to Tchichatschef, the enchantment of the scene—the vista of stalactites, half dazzling white, half yellowish which cover the wall—beggars description. Something similar may be seen in the province of Auckland in New Zealand, in the Tetarata, on the northeast coast of Roto mahana. The hot bubbling water flows out of a snow-white basin covered with stalactites, eighty feet long and sixty broad, over self-formed terraces, hewn as if out of dazzling marble into series of deep blue basins, such as the most refined luxury could not have devised better; from their gradual descent a gradation of temperature takes place; and they are large enough for a man to swim about in comfortably.

It is therefore no fable when the Greeks speak of bridge-building springs. Tchichatschef has made a very fine drawing of the one in Pambuk Kaleffi, which, spanning the dry bed of the river, affords the traveler resting beneath an agreeable coolness from the evaporation of the dropping water. On the way from Erzerum to Trapezunt, Eli Smith saw another. In this one the crust of the tufa had grown too heavy, broke, and having fallen into the river formed the pillar across to which this natural bridge is thrown. On the way from Algiers to Constantine you meet with springs whose bubbling noise and rising columns of vapor are to be seen and heard from a great distance. An innumerable quantity of dazzling white calcareous pyramids here assume the oddest rocky shapes. The Arabians tell about them, how a mighty chief had wedded against the laws of the Koran, and Allah, wroth with the Marabut who married them, transformed the bridal pair and all the marriage guests into stone; and the wicked boiler that contained the marriage feast

was condemned forever to boil and bubble. Hence the name Hamman el Meskhatin—the cursed spring.

Frequently the stalactites rise gradually tube-like ending in a wide basin. The hot water running into this basin has naturally a much higher temperature at the foot of this tube than at its surface; the vapor bubbles which form beneath having to bear, not only the pressure of the atmosphere, but the pressure besides of the column of water above them. Those above approach the boiling point, but those waters which from their cooling on the surface, cannot reach that point, suddenly boil up when brought by a stronger swell into chance contact with larger bubbles, sending up the water mixed with steam with an enormous force to a great height. The best known of such hot springs are the Geysers and the Strokker in Iceland. The temperature of the water of the former at the bottom of a shaft of fifty-nine feet deep and nine feet broad is a hundred degrees, hence twenty degrees warmer than the usual boiling point; the temperature of the latter, ninety-two degrees at a depth of twenty-seven feet in the tunnel which reaches forty feet down.

The usual height to which the projectile force of the latter carries the water is one hundred and fifty feet, but on the removal of a possible obstruction at the lower opening it may rise to one hundred and eighty.

The New Zealanders say of the Tetarata that sometimes the whole body of water is hurled out of the principal basin with an awful force; on these occasions one may look down thirty feet into the empty basin which, however, rapidly refills.

The crustatious deposits of cold springs correspond to the thornstone of our drying houses, while the incrustations of hot springs may find their analogy in the sediment which overlays our steam engines, the removal of which remains a still unsolved problem.

The vastest mineral spring is the ocean itself. But the balance in which its component parts are held, chiefly effected through evaporation, influx and other organic processes, can only then be understood when we shall have traced the farther course of those waters which are, so to say, born of the springs, viz: brooks, streams and rivers, over the surface of the earth, the study of which would form a second part to our present

train of reflections and would be the immediate visible supplement to that Circulation of the Waters, the first processes of which, from their taking place in the regions of the air and under the ground, hence removed from our sight, have been so long misunderstood.

[*For the California Teacher.*]

EDUCATION.

Many years ago, in the good old days of chattel slavery, when the poor whites, equally with the colored slaves, were denied the benefit of a public school, I found myself on the sacred soil of Boone Co., Missouri, re-engaged to teach for a time a sort of class school. The roads in those good old days were fearful sights to travelers from the unchivalric free States; and the small room, with its dingy walls, worm eaten desks, broken windows and demoralized chimney, which was honored by the name of school-house, was not calculated to inspire confidence in a young woman not accustomed to the ways of "first families." My principal patron, a senator from Kentucky and a perfect gentleman to every one whom he did not own, asked me at the outset how many hours I should teach in the day.

"Six, I suppose," I replied, "since that is usual, though the children would be brighter if they dealt with books only five hours a day."

"Oh dear me," he said, shaking his head with solemn disapproval, "the last man taught *eight* hours."

"You'd better get him back again at once," I answered. "Where did he come from?"

"Well, he was a German, but he would smoke all the time in school, and the children could not quite understand his English and did not get along."

"No wonder," I thought. "Eight hours a day at books would make children stupid, without the addition of tobacco smoke." Now what I wish to explain is, that this Kentucky senator was a well informed man, possessing great originality and force of character; a man whose personal influence in the neighborhood was equal to retaining the services of an anti-slavery teacher, who would otherwise have been dismissed; yet because he had

acquired most of his education outside of schools, and was modestly conscious of his own deficiencies, he imagined that eight hours a day schooling would leave his sons with as much character and more intellectual ability than himself. I need not assure you that this mistake of his caused great injury to his boys, who, under this system of all books and no work, grew up to have less individuality and less mental power than their father had earned. Now it seems to me that at the present time, in this State as well as in other States, the quality and quantity of the instruction provided for our youth of the public schools and to a great extent in private schools also, has been determined on this same mistake, viz: that if a boy's application to school books three hours a day, gives the man great advantage over him, who in youth was deprived of such opportunity, then the boy who devotes nine hours a day (in and out of school) to a similar exercise of his mental faculties, will find himself as a man possessed of three times the ability of the first mentioned; and such is really the opinion of the uneducated and the so called self-educated, and it is this *average* public sentiment which has got itself organized in our schools, and not the enlightened views of the truly cultivated minority, or of our genuine scholars and philosophers, who by experience, observation and study, have become acquainted with the laws of mental development. Thoughtful and cultured parents, dreading the effect of this system of emulation and cramming which substittues memorizing for culture, destroys all the intellectual tastes, and wearies body and mind alike, are put to their wit's end in their endeavors to educate their children at all. Some avail themselves of the objectionable teaching for short definite periods, and then trust to home influence, suitable reading and separate studies, to bridge the gap, keep the mind active and pure intellectual tastes alive; others hope to get what they desire at private schools; but so dominant is the superstition that books create brains, that they seek in vain in that direction. The uneducated man, the self-made man, on the contrary, sends his children to school, in the full belief that the school is a thoroughly satisfactory institution. Because in early life he failed to obtain a sufficient introduction to the knowledge contained in books and now finds himself at fault in

the presence of well-educated people, he does injustice to his own ability and character, and jumps to the conclusion that book-learning is what makes the man. Acting on this idea, he makes up his mind that *his* boy shall go to school early and stay long; he shall never be hindered in his studies by work, but, if possible, dressed as a gentleman, he shall imbibe continually the knowledge that will give him power and take him out of the ranks of labor. The unselfish and otherwise sensible parent flatters himself with the picture of his son—a noted lawyer, doctor, senator, or even President. What is to hinder such a result in a free country? he thinks. But when after all the money expended on him, he finds his son turn out an inefficient, incapable fellow, perhaps a fifth-rate lawyer, "smart" enough to relieve the "old man" of his careful savings, or a characterless doctor not likely to find patients, he begins dimly to suspect that there must have been some flaw in his theory of education, of book-learning, and indeed there was a most serious and fatal flaw in it, for the first idea that should be impressed on the boy, and the girl also, is that all education should subserve two purposes: first, to enable the youth to earn an honest living (instead of the weak and unjust supposition that this is in some way to be filched from the labors of others); then, to discipline and develop his mind, that he may find himself abreast of his age and of service to humanity. How entirely this truth is submerged under our present method of teaching, I need not here explain. In place of directing attention to the glory and beauty of the mechanic arts, of agriculture, pomology, manufactures, and showing that on the condition of these depend the main difference between barbarism and civilization; instead of giving early in connection with books some manual instruction and urging every pupil to honor his occupation by his intelligence, refinement, and upright conduct, the impression made on him directly and more especially *indirectly*, is, that education and labor are naturally disconnected, and that all handicraft is, if possible, to be avoided. He finds the impression abroad everywhere—in home, and school, and street, that it is more desirable, more respectable, to get a living by one's wits than to be a *creator* of wealth. Hence he learns to look on a patient apprenticeship to some valuable trade

as an altogether dull and tedious affair. He hopes through the assistance of the three R's to rise above labor, and, in consequence, he generally sinks far below the level of a skilled artisan. The swelling numbers of this class of non producers in our country serve to increase the burden of the manufacturer and mechanic. We have yet in our veins the virus of aristocracy which grades worth by its worthlessness. We write stories to immortalize the modus operandi of the millionaire and to celebrate the good fortune of those who by some chance have been transferred from the useful to the idle class; and we put these books into the hands of our boys with the silent suggestion that they go and do likewise; thus teaching them that to take tithe of industry is more praiseworthy than to create by industry. The evil effects of this false education is to be seen in our hordes of unemployed clerks, low-caste lawyers, forgers, industrial school inmates, and suicides. Meanwhile, we are obliged to import from Europe most of our skilled workmen. Is this no blot on our system of public instruction? As Professor Seely remarks, the school should supply what the home cannot, what very few homes in any land do supply, viz: a clear intellectual atmosphere. In this it would be seen that labor was invigorating to mind and body, that it was not to be avoided, but courted, and School Boards believing this, as they would if they were chosen from the proper ranks, would proceed to organize mechanical schools as a part of public instruction.

Our standard for teachers would then be somewhat changed. It would then be higher in the direction of reasoning faculty, judgment, and the enthusiasm, without which no work is well done; and lower, in respect of technical knowledge. It is quite possible for a person who has crammed himself, to give correct answers to all the questions contained in a First Grade Examination paper, and yet be deficient in every requisite for a teacher. In fact, the more the mind has been dealt with by the present damaging methods, the more it has been strained to accomplish this marvelous feat in examination, the more the higher intellect will be found inactive and the finer qualities of character wanting. Professor Seely says: "Where the spirit of original inquiry is most active among teachers, there the

teaching is best, and on the other hand, where it is languid or dormant, the teaching, however assiduous and conscientious, is degrading in character." This spirit finds as worthy scope in a Kindergarten or Intermediate, as in a High or Grammar School. Originality finds ample space for activity in the simplest, as well as the broadest field, a child becomes awakened and receptive in this vital atmosphere, while the dry mechanical sphere of mere memorizing is almost as deadening to the powers of the mind as the air of a convent, where the use of the reason is strictly prohibited. Under the old system, and before cramming was embodied in the law, annihilating the freedom of the teacher, and precluding all approach to *culture* in the school, many a girl of eighteen and twenty managed to inspire her pupils with a passion for self-culture, and an enthusiasm for all that is true and beautiful, that lasted through life. But in the harness provided now, alike for the large and refined, and the narrow and coarse teacher, individual genius and influence is set aside; all that is required or permitted is a machine to keep order and cram the scholars. A pupil of Ralph Waldo Emerson once said to the writer: "It was heaven to follow where he led; he illuminated the simplest lesson by what appeared the simplest word; he lifted us up to a higher plane of thought by his presence alone, and we worshipped him accordingly." Imagine this young genius in the present harness made and provided; imagine him after graduating with honors at Harvard, being refused a school, unless he could answer the questions invented by our literary experts as tests of the qualifications of teachers. He of course would have been equal to about one in twenty or thirty, as was the case lately with a highly cultivated Scotchman of the writer's acquaintance. But the question of "examinations" must be deferred to another paper. G. B. K.

PEEPS THROUGH THE DOOR OF A KINDERGARTEN.

"Henry" said I, one morning last week, "I am going to visit that Kindergarten up on Liberty street to-day. Mary went yesterday, and she said it was delightful. Won't you go along?"

"Really, I can't this morning, my dear. I must go to the office."

As this was just the reply that I expected he would make, I put on my bonnet without more words, and taking little Majorie, instead, we were soon on our way. The air was mild, and the walking good, and soon we past through an iron gateway, upon whose arching top, gleamed, in letters of gold, the magic word which had brought me,—Kindergarten.

My ring at the door-bell was answered by a wee maiden, in a blue dress, and white linen apron, whose tiny hands could just reach the knob, and who asked us if we would please come in and take some seats. The room which we entered was a large hall, containing no furniture except a piano in one corner, and a case in another, in which were arranged small dumb-bells, rings, wands, etc., for gymnastic practice. No one was in the room, but I heard the murmur of merry little voices, not far away, and presently a door opened, and one of the teachers came out from the adjoining room and greeted me very cordially.

"You may go back now, Mabel," she said, turning to the child, and the little one disappeared.

"I came in to see your school this morning," I said, by way of introduction; "I suppose you admit visitors?"

"O, yes," she replied, pleasantly; nothing would please me better than to have company all the time. Will you walk into this room?"

She opened some folding doors, and I, following her, saw some half dozen long, low tables, at each of which were seated, perhaps, twenty children. A lady teacher sat at the head of each table, and the children were arranged along the sides in little chairs. Miss Hamilton—the principal, as I afterwards learned—conducted me to her own table, which stood at the head of the room. I took the chair she placed for me, and looked with a pleased surprise at the bright faces around me. The children at that table were all, I should think, between six and seven years of age.

I noticed for the first time, then, that the floor of the room, instead of being covered with little feet painted at regular intervals, like the hall I had just left, had a network of squares, a foot large, painted in bright colors, and the tables were each traced in black, with squares an inch large, so that they looked like huge chess boards. When I asked Miss Hamilton the

object of these, she said the children should tell me themselves. She said something to them in German, which I did not understand, but which had the marvelous effect of crossing twenty pairs of little hands upon the table in front of them, and then she said:

"Children, how large are the squares upon the table?"

"One inch," said all together.

"How large are the squares upon the floor?" was the next question.

"One foot."

"How many inches make a foot?"

"Twelve inches make one foot," they replied.

"How many feet make a yard?"

And when they said "three feet," she asked who would show her a yard on the floor. Every hand was raised, and she said, smiling—she smiled nearly all the time, and I saw that the children smiled too, when they looked at her face—"Well, Bertie may." Whereupon a dear little fellow in a blue suit left his seat, and going up to her remarked gravely, "I want your foot, Miss Hamilton."

"Well, you shall have it," she replied, laughing, and rising, she placed her foot at the side of one of the squares, while Bertie set his tiny one three squares off, saying, "there is a yard."

"Now who will draw on the board a line a foot long?" she asked, when Bertie had taken his seat.

Instantly all the hands were up again, and all the faces were looking eagerly into hers for permission.

"Well, you cannot all do it. I think Alice may try." So Alice went to a blackboard on the wall, and with a crayon drew a long, straight line, and took her seat with a satisfied air, very amusing to see.

"O, please measure it, Miss Hamilton," exclaimed two or three, and Miss Hamilton took her pointer and measured off a foot from the floor. When she had laid the pointer on the crayon line it lacked just about a quarter of an inch, which quarter Alice immediately added.

I was astonished at such a feat performed by such a child, and asked Miss Hamilton if many of the children could do that.

"Nearly all of them will come as near to it as that," she

replied, "and some of them a great deal nearer. They have tried so many times, that their eyes are trained to measure distances."

Then she went to a cabinet and took out a package of yellow papers. They were squares, about four inches long each way. These she passed to the children till each child had one before him on the table. I should have said before, that a square of the table a foot and a half large was devoted to each child, and this was again divided into inch squares. Into the middle of these squares went the yellow papers, and the little hands were again crossed, till the teacher unfolded hers and took up her paper. I cannot tell you how those papers were folded. It is something that can scarcely be described, and one must go to a Kindergarten, as I did, to see how it is done. The children folded the papers exactly as Miss Hamilton folded hers, watching her every movement, and at each folding came the question and the answers which so surprised me. At the first folding she asked:

"What have we made now, children?"

"A triangle," was the reply.

"What is a triangle?"

"A figure having three sides and three angles."

"Who will point out the triangle on the table?"

The margins between the large squares were filled with geometrical figures, and one little hand was laid upon a triangle.

"Who will draw on the board?"

Every child wanted to try, but only one was allowed to go. He drew a fine figure, I thought, for such a baby, but one little girl said that there was a dimple in one side, which remark, I presume she had heard her teacher make with regard to some other figure.

"What kind of a triangle is this?" asked Miss Hamilton, holding up her paper.

"A right angle triangle," said one bright little fellow.

Miss Hamilton smiled at him and asked why.

"Because it has a right angle."

"And what are the other two angles called, Benny?"

"Acute angles," said Benny.

When these children had finished their folding, each yellow

square of paper had been transformed into a bird, with head, feet, and tail complete, which the children set up on the table two by two, facing each other, and sang a song about the birds, after which it was time to go home.

"You have only seen the least little bit of the Kindergarten; you came so late, and we do different things on different days. Will you come again?"

Miss Hamilton had accompanied me to the door.

"I will come often if you will let me. I am delighted," I said.

"As often as you like," she replied, kindly.

Marjorie was in high spirits, having been promised that she should become a Kindergarten scholar next week.—*Rural Home.*

From the Iowa Classic.

ART EDUCATION.

II.

Last month we spoke of drawing as an elementary branch of Art Education and especially in its application to industrial interests. We presented two points: The ability of all to learn drawing; and its financial advantage.

In connection with the second we wish to add a few statements, and further to speak of the manner of supplying art instruction in the common schools.

It is stated that at the Universal Exhibition of 1851, among the great nations the United States stood the lowest and England the next lowest in respect to art manufactures. England immediately established Schools of Art in all the large towns. At the Paris Exhibition in 1867 England stood among the foremost, the United States still occupying "her place at the foot of the column." This is unworthy the character of a great nation to whom industrial art is so essentially important.

But this low stand in industrial fine arts is a great financial disadvantage.

Mr. Walter Smith says: "The whole nation is deploring the lack of good ornamental designers. We are becoming tired of sending so many millions to Europe for articles that we might

produce cheaper at home if we had skillful designers. This branch of industry affects articles for the homeliest use."

One manufacturer of Massachusetts says that the designs necessary in their establishment cost them "forty thousand dollars a year, every dollar of which went to England, France, and Germany. If a school of art had been in operation in that city for ten years, the designs would have cost the manufacturer perhaps five thousand dollars; and the dollars kept within a mile of the mill—a clear gain of forty thousand dollars a year to the country in one city alone."

There are three elements of value in a manufactured article: [1] Material, [2] Labor of production, [3] Art character. In all the countries in a vast majority of manufactured articles the material and labor are insignificant in comparison to the value of their art character. It is true as has been stated: "As long as civilization is allowed to pursue its course, however tastes may change, and whatever developments may be wrought, the stamp of good, honest, skillful, and cultured art industry will not only preserve its value, but pay compound interest as well."

Although Iowa is largely an agricultural country, yet the subject of manufactures, in the hands of individual mechanics and those of the manufacturing company, will continually assume increasing importance to the intellectual and financial interests of our people.

In no way can these interests be more efficiently and economically advanced than by introducing Drawing into the common schools and higher institutions in the State.

But an important practical question presents itself: *Whence shall we obtain art teachers for our common schools?*

There can be no special teachers in Drawing in the common schools any more than special teachers of penmanship. The teacher must include among his acquisitions and qualifications the ability to teach drawing as well as penmanship. Let a demand be created by a law requiring it and the supply will soon be at hand.

With the excellent and progressive systems of learning and teaching elementary drawing now published in this country, every intelligent, and moderately skillful young person can soon

learn to conduct the elementary exercises in drawing in his school; and as his scholars advance, he can still improve.

The system of Drawing published by J. R. Osgood & Co., for the public schools—commencing with the primary—of the State of Massachusetts, edited by Walter Smith, State Superintendent of "Art Instruction," carried out also to an extended course for Normal and other Art schools, is, and will be probably, the most thorough and valuable course published for years. Krusi's system published by Appletons is also a valuable means of instruction to the scholars and directions to the teachers. Both systems have drawing books and copies for scholars, and manuals for the teacher.

At each session of County Institutes, let a teacher of Drawing be employed, and every member required to undergo preparatory training.

In the city high schools, let a similar provision be made to assist this supply.

And in our colleges—as in this University—let Elementary Drawing be free of tuition and compulsory upon all.

Such means employed will soon furnish teachers for the beginning of the work.

In some of our colleges, let special means be used to develop an Art Department of a high character to give tone and assistance to this interest. Such is the effort now in progress in the Iowa Wesleyan University.

PRACTICAL TEACHING.

The public school should be the place to prepare thoroughly for the practical business of active life; and it fails to accomplish its work, so far as it fails to secure this result.

I can in no way illustrate and enforce the suggestions made above upon practical teaching, so well as to refer my readers to the German primary school, which, it must be conceded, is the model school of the world. The subjects taught in this school are religion, reading, writing, counting, mental arithmetic, writing to dictation, singing, grammar, repeating prose and poetry by heart, drawing, natural history, botany, and geography; not all at once, but gradually and thoroughly. The

school opens at seven in the morning, and closes at eleven. One hour is devoted to religious, and three hours to secular teaching ; and then the school-day is over. The masters are always fresh for work, and the children active, but not fatigued. There is no sham teaching, or dawdling over forms, in this school.

Elementary teaching in Germany is made eminently practical, by applying the principles of each department studied to the business transactions of ordinary life. The teacher imagines, for instance, the purchase of some apples, and requires the children to calculate what will be the price of a certain quantity, and how much change they would get back for a dollar or half a dollar paid for them. The whole class are called into consultation, and much fun awakened by the incidents of the bargain. Writing is taught so as to include composition. No German boy or girl leaves the primary school who is not able to compose and write a respectable letter. But every teacher will be interested to know just how this German school is conducted, to secure such practical results. I can in no way so well give this information, as by quoting the description of an eye-witness who attended an hour's examination in one of these German primary schools.

"The class being ranged, with slates and pencils in their hands, the master propounds the subject. 'Let me see,' he will say, 'to-day is market-day. You live, we will say, not here, but in the little house just beyond the village, three miles away. Mother sends you to market with something to sell, and for something to buy ; but you are not to go home to-night, and so you want to write a letter telling her what you have done. Now then, begin. What shall we write down first ?'—'I have sold three hens for———' shouts a little, fat, white-haired fellow, who plainly it used to selling his mother's farm produce. 'Stop !' says the master : 'you are too fast. That's not the way to begin : we will come to that after.' Here several rise, and ask to be heard. A little girl, with golden hair plaited down the back, shouts out, 'My dear mother !'—'No,' says the Herr : 'that's good ; it will come later.' Another : 'To-day is Friday !'—'That's right ; but there is more to add.' At last it is settled that the name of the place, and the day of the month, and perhaps the hour of the day, if need be, shall all be set

down first, and at the right hand of the letter, before anything else be done. Having settled now what is first to be done, next comes the question how to do it, and the competition who shall do it best. The end of the room has huge blackboards, sponges, and chalk, and towels, with little long rows of steps for the little ones to climb up. The letter has first to be written out (in draft) on the blackboard, and corrected and settled finally before it is allowed to be written with ink on paper. Now, then, a child is called to write out (one on each board), at the right hand corner, the name of, say Rottenburg; the day, Friday; the date, Sept. 20, 1871. The arrangement of this gives rise to a variety of opinion and discussion. Shall 'Rottenburg' go down as two words or one? Shall 'burg' have a capital letter to commence with? Shall a stroke part the words? or shall the whole be written together? Shall 'Friday' go below or on the line? Shall we write 20 Sept., or 20 September, or September 20? Shall we put 1871 below or on the line? Shall we begin near the top of the board, or lower, or more right or left? write on three lines, two lines, or one line? At last the test is settled; and the master asks the cleverest girl to write out the pattern agreed, dating at the right-hand corner, with the proper margin all round; and this is now copied over by each on the slate as the right heading. 'My dear mother' is rightly placed at last the same way; and, preliminaries adjusted, the real business of the day begins in earnest. 'My dear mother—I did not get into Rottenburg before the hand of the clock on the lower church told three quarters of eight,' and so forth. The letter being finished, revision and criticism begin. Each pupil changes slates with his or her neighbor, who has to pick flaws, and find fault. The corrected slates are shown to the master, who gives the finishing touch. At last they all sit down to the desk, take pen and ink, mend their pens, rule their paper, and write out the letter fairly on the pages of their book, which is to form a standard reference for any letters of the sort they may want to write in their future life.

In all this proceeding, there is nothing very new perhaps, but is so admirably done that the spectator cannot help taking an interest in the process. Every item entered is made a mat-

ter of discussion. The prices of fowls. How much a fat fowl should weigh. How much a lean one. A reasonable price. What food fattens fowls best. What sort of fowls they are, and how old. The price of cabbage, of carrots, of apples: their sorts, the quantity produced—every thing to bring the school home to the life wants, interest, and duties, is done, the scholars themselves contributing each his mite to the store of information the letter contains. The expenses, too, of the day, the bargains, and the shops, are all discussed. After one such display as this, I went home, looking at the baskets in the market, at the donkey-carts lading for return home, at the buyers and sellers, and at the goods in the little shop-windows with more interest than ever I had in such things before. I felt that in this German school the children were training for the real duties of their lives."—*Orcutt's Teachers' Manual.*

MISCELLANY.

Geographical Changes in Europe—The researches made by M. Levasseur as to the relative extent of territory and population of France, England, Prussia, Austria, Germany, and Russia at the beginning of the eighteenth century, and the subsequent increase or decrease, give an idea of changes which have since occurred in the positions of what were then the six great European powers.

In 1700 France had a territory of 493,000 square kilometres; Great Britain, 313,000; Prussia, 110,000; Austria, 510,000; Germany, 660,000; and Russia, 3,212,000—their respective populations being: France, 10,000,000; Great Britain, 9,000,000; Prussia, 2,000,000; Austria, 12,000,000; Germany, 20,000,000; and Russia, 10,000,000. In 1789 France had 536,000 square kilometres, and a population of 26,000,000; Prussia had in the meanwhile doubled both her territory and population, while the other Powers had made a considerable stride in population, but had remained relatively stationary in regard to territory.

After the vicissitudes of the revolution and the Empire, France found herself in 1815 with only 6,000 square kilometres less than in 1789, and a population of 30,000,000. Prussia, in the meanwhile, had again both doubled her territory and popu-

lation which stood at 280,000 square kilometres and 10,500,000. Austria had 665,000 square kilometres and 30,000,000 inhabitants; Great Britian, whose superfices had remained unaltered, had a population of 18,000,000; and Russia had increased her size to 5,450,000 square kilometres, and a population of 45,000,000.

The France of to-day, setting off the gain of Savoy and Nice against the loss Alsace and Lorraine, has 582,000 square kilometres—or 6,000 more than in 1815—with a population of 36,000,000; Prussia has a territory of 352,000 square kilometres and 24,000,000 inhabitants; Austria has 622,000 square kilometres and 36,000,000 inhabitants; While "Germany" stands at 544,000 and 40,000,000 inhabitants. The population of Great Britain has nearly doubled since 1815, and Russia numbers 72,000,000 inhabitants upon the 5,559,000 square kilometres of her territory. Italy, whose existence as one Power is only of recent date, has now 296,000 square kilometres and 26,500,000 inhabitants.

THE old school-books gave very exaggerated ideas of many things. They were magnifying glasses for the young. They described whales as being as long as the tallest church steeples are high, with mouths as big as a church door, and these assertions seemed to have the sanction of the church. Even Cuvier says that there have been whales three hundred feet long; but he never saw one half that length. A Mr. Scoresby, a whalefisher of California, has been revising natural history on the subject of whales. He has assisted in capturing three hundred and twenty-two of these monsters, and not one of them exceeded fifty-eight feet in length. The largest one he ever saw was sixty-seven feet long. A dead whale, one hundred and five feet long, was discovered floating in Davis' Straits, and a skeleton of one, one hundred and twelve feet long, was found in Columbia River. Scoresby thinks that the bookmakers ought to know and record these facts

AN INSTRUCTIVE EXPERIMENT.—The principles in the circulation of the waters of the sea were beautifully shown before the Royal Geographical Society, recently, by a simple experiment.

A trough with plate-glass sides, about six feet long and a foot deep, but not more than an inch wide, was filled with water. At one end a piece of ice was wedged in between the sides to represent the polar cold, while the tropic heat was represented at the other end by a bar of metal laid across the surface of the water, the projected end of which was heated with a spirit lamp. Red coloring matter was then put in at the warm end, and blue at the cold end, so that the currents could be traced. The blue water, chilled by contact with the ice, immediately fell down to the bottom, crept slowly along, and gradually rose toward the surface of the equatorial end, after which it gradually returned along the surface to the starting point. The red water crept first along the surface of the polar end, then fell to the bottom just as the blue had done, and formed another stratum, creeping back again along the bottom and coming to the surface. Each color made a distinct circulation during the half-hour in which the audience viewed the experiment.

TEACHING.—The Norfolk (Conn.) *Sentinel* says the hearing of recitation is not teaching. In most of our schools nothing is learned except what is in the books, and the pupils are required to recite nearly the whole six hours of the school day. At the close of school for the day each is loaded with text books and sent home, in each of which he or she is required to learn before the opening of school, a lesson. No matter how long or hard the task—no assistance except from father and mother, who, though perhaps good scholars when Brown, Daboll and Webster were in vogue, find themselves totally incompetent to comprehend the jargon and crotchets of modern approved text books. No time for play, no time to rest, and hardly time to sleep—the fact entirely ignored that the eyes and health are far more precious than book learning. To such an alarming extent is this fatal nonsense insisted upon by our teachers, that judicious parents consider it their duty to invent excuses, from time to time, to keep their children out of school.

THE SLEEP OF PLANTS.—The phenomenon called the sleep of plants was first observed by the illustrious Swedish botanist, Linnæus. He remarked in the bird's-foot trefoil the difference

between the attitude of the leaves during the day and night. He almost immediately concluded that this would prove to be a general phenomenon in vegetable life. Continuing his observation, Linnæus soon satisfied himself that this change in the position of leaves during the night is observable in many vegetables. He regarded the absense of light, and not the nocturnal cold, as the principal cause of the phenomena; for plants in hot-houses close themselves during the night, like those in the open air. He found the difference between waking and sleeping to be much less apparent in young plants than in more matured ones, being most clearly indicated among the compound leaves. The object, he thought, is to shelter the young shoots from the effect of the air. These strange phenomena occur in all hygrometrical conditions of the atmosphere, and are uninfluenced by changes of temperature. De Candolle, supposing the cause of the phenomena to be the absence of light, subjected plants to the action of artificial light, with very varied results. He concluded, from his experiments, that the movement of sleeping and waking are connected with some disposition inherent in the vegetable, but which is thrown into special activity by the stimulating action of light, which acts with different intensity on different vegetables, so that the same amount of light produces different results in different species.

THE condition of the teaching profession is a matter of public concern. Above whatever else concerns the schools, the teacher stands pre-eminent in his power to further, retard, or altogether defeat the ends of popular education. No more subtle power than the teacher's influence can be conceived for the shaping of the mental habits and moral intrepidity of the youth of our country. No age equals our own in placing in the hands of the teacher the dearest, highest interests of society. Jealously must society watch that these hands are worthy of the trust. We must no longer be contented to bear with an unworthy teacher, in hopes that the beginning of next term will bring a change for the better. We must no longer trust to chance for sending us a trained teacher; we must demand trained teachers as our due, and trained teachers will be supplied.

HOW COFFEE WAS DISCOVERED—We read a quaint story concerning the discovery of this favorite beverage. Toward the middle of the fifteenth century a poor Arab was traveling in Abyssinia, and, finding himself weak and weary from fatigue, he stopped near a grove. Then, being in want of fuel to cook his rice, he cut down a tree which happened to be covered with dead berries. His meal being cooked and eaten, the traveler discovered that the half-burned berries were very fragrant. He collected a number of these, and, on crushing them with a stone, he found that their aroma increased to a great extent. While wondering at this, he accidentally let fall the substance in a can which contained his scanty supply of water. Lo, what a miracle! The almost putrid liquor was instantly purified. He brought it to his lips; it was fresh, agreeable, and in a moment after the traveler had so far recovered his strength and energy as to be able to resume his journey. The lucky Arab gathered as many berries as he could, and, having arrived at Arden in Arabia, he informed the Mufti of his discovery. That worthy divine was an inveterate opium smoker, who had been suffering for years from the influence of that poisonous drug. He tried an infusion of the roasted berries, and was so delighted at the recovery of his own vigor, that in gratitude to the tree he called it cahuah, which in Arabic signifies force. And that is the way in which coffee was discovered. How many thirsty Christians bless the memory of their Arabian benefactor during these sultry days, when thirst seems almost quenchless!

"ALL roads lead to Rome;" so all lines of educational improvement converge to one central object—*the teacher.* The importance of other elements that go to make up a good school may be and often are overestimated. Not so with the teacher. The teacher *is* the school. How to secure a teacher who understands and loves his work—this is the educational problem at all times and in every place. It is a comparatively easy matter to build good school houses and make a judicious choice of text books, and draw up a rational and sound scheme of instruction; but to furnish such teachers as are needed is a very different thing.—[*Supt. Philbrick of Boston.*

DEPARTMENT OF PUBLIC INSTRUCTION.

IN REPLY to an inquiry, we wish to state that a teacher cannot demand pay for vacation, or for days or weeks not actually taught, except for the days which a teacher may be in attendance upon a County Teachers' Institute. The general custom throughout the State is to pay only for the time actually taught. A contract, say for a ten months' term of school, means that the teacher must teach ten times twenty days; and the trustees may arrange the vacation in any manner they choose, provided that school is kept open for two hundred days.

THE FIFTH Biennal Report of the Superintendent of Public Instruction will shortly be mailed. One copy will be sent to each district clerk and county and city superintendent throughout the State. As the postage for this will amount to over two hundred dollars, no reports will be mailed to teachers, except the postage, ten cents, necessary for prepayment, is sent. Only a limited number will be at our disposal for general distribution.

IN THE December number we notified all persons interested that the County Superintendents elect take office on the first Monday in March, 1874, and hold office till the first day of January, 876. This notice was based upon a decision of the Attorney-General. Since then, the Political Code has been so amended that county officers take office on the first Monday in March, as heretofore, and not on the first day of January, as provided by the Political Code prior to the above mentioned amendment.

"IS IT proper," asks a County Suporintendent, "to use the State School Register for class recitations, say to register the names of pupils of the respective classes in arithmetic, geograpny, grammar, history, philosophy, algebra, etc., and to keep their standing of merits on separate registers than on the register for attendance and deportment?"

The above query must be answered in the negative, if the register is to be used to show the daily standing of every scholar in each study. By law, this department can furnish only such blanks, books, etc., as may be necessary to the discharge of the duties of the several school officers. The Register is prepared in such a manner that teachers may be able to report the data required of them by this department. The arrangement of the Registers admits, however, of a *monthly* class register being kept for each study. The necessary instruction may be found under the suggestions prefacing the last edition of school registers. We call the attention of those who desire to keep a daily class register to the *Model Class Register*, lately published by Messrs. Libby & Swett of San Francisco, as this is the best arranged book we have seen on the subject.

According to section eight hundred and seventy-eight of the Political Code, "every office of which the duration is not fixed by law is held at the pleasure of the appointing power." Section seventeen hundred and sixty-eight of the Political Code does not fix the time for which a County Superintendent appoints the members of the County Board of Examination, and these hold office, therefore, at the pleasure of the County Superintendent.

List of Diplomas and Certificates granted from November 1st, 1873, to January 10th, 1874:

LIFE DIPLOMAS.

Anderson, Mrs. C. A.
Barr, Miss Sara A.
Batchelder, T. H.
Burke, Lizzie K.
Campbell, F. M.
Cooke, Miss Hannah
Eickboff, J. H.
Foster, Mrs. J. A.
Hamilton, Miss Addie
Hammond, Josiah Shaw
Hoffman, Mrs. Mary L.
Hurley, Miss J. M. A.
Hutton, Charles E.
Lamb, Miss Irene
Levy, Daniel
Manning, Miss Agnes
Milliken, Mrs. Ellen A.
Miller, Miss Ora E.
Morris, N. Z.
Otis, C. W.
Overend, Miss Lizzie
Shearer, Mrs. C. C.
Shipley, J. C.
Stineen, Miss Alice M.
Stone, Mrs. B. H.
Sumner, J. H.
Temple, Emma
Wheelock, Mrs. D. B.

EDUCATIONAL DIPLOMAS.

Following are the diplomas awarded, with the date of their expiration:

BETANCUE, MISS LIZZIE, December 13th, 1879.
BROWN, J. B., January 10th, 1880.

CROSS, C. W., December 13th, 1879.

DOYLE, MRS. JAS. A., December 13th, 1879.
DUNBAR, ANNIE S., January 10th, 1880.

FLINT, ELMIRA T., November 1st, 1879.

GRANT, MISS HELEN A., December 13th, 1879.
GREER, MISS C. E., December 13th, 1879.

HAMILTON, MRS. W. H. H., December 13th, 1879.

JEWETT, MISS FIDELIA, December 13th, 1879.

KELSO, JNO. R., November 1st, 1879.

LANDER, F. L., November 1st, 1879.
LYNCH, MISS TILLIE S., December 13th, 1874.

TILLOTSON, HENRY IRA, January 10th, 1880.
TROUT, DANIEL H., January 10th, 1880.

WHITE, MISS LOUISE E., December 13th, 1879.
WOODWORTH, MRS. J. E., December 13th, 1879.

FIRST GRADE CERTIFICATES.

ASHTON, MRS. N. S., January 10th, 1878.

BARRY, CHARLOTTE M., January 10th, 1878.
BATEMAN, J. N., November 1st, 1877.
BENTLEY, LETTIE E., January 10th, 1878.
BICKNELL, BERTHA A., January 10th, 1878.
BLOOMER, A. C., December 13th, 1877.

CLARK, ELLA D., January 10th, 1878.
COLBY, JULIA E., January 10th, 1878.
COURTER, H. F., November 1st, 1877.
COX, MISS K. M., January 10th, 1878.
CROFTON, MISS K., January 10th, 1878.
CROTHERS, CAROLINE H., December 13th, 1877.

DWINELL, ALICE H., December 13th, 1877.
DWINELL, JENNIE K., December 13th, 1877.
DRAKE, ELMER, January 10th, 1878.

EVANS, MISS L. M., 13th, 1877.

FLOYD, ENOS F., November 1st, 1877.

FURLONG, ROBERT, January 10th, 1878.

GRAHAM, MISS E. E. V., November 1st, 1877.

HALL, MISS F. M., January 10th, 1878.
HAMMETT, LAURA E., January 10th, 1878.
HARRIS, MISS S. J., January 10th, 1878.
HEMSTED, LUCY, November 1st, 1877.
HOGBIN, R. M., November 1st, 1877.
HARDY, GEO. H., November 1st, 1877.

KELLOGG, FRANKLIN E., January 10th, 1878.
KANE, RICHARD, January 10th, 1878.

LEWIS, FANNIE, January 10th, 1878.

MADDUX, MARY, January 10th, 1878.
MAURER, CLARA, January 10th, 1878.
MCDONALD, J. J., January 10th, 1878.
MCDONALD, MISS KATE, December 13th, 1877.
MCCALL, CHAS. M., November 1st, 1877.
MCFADDEN, JOHN, January 10th, 1878.
MICHAELSON, LOUIS CHR., January 10th, 1878.
MCKUSICK, H. P., December 13th, 1877.
MOORE, J. P., December 13th, 1877.
MURRAY, ADAM, November 1st, 1877.

NEWCOMER, JACOB, November 1st, 1877.
NORVELL, JAS. A., January 10th, 1878.

OSMER, MRS. E. C., December 13th, 1877.

PINKHAM, CAROLINE H., November 1st, 1877.
POSTON, JNO. M., November 1st, 1877.

RIGHTER, F. M., November 1st, 1877.
REILLY, M. J., January 10th, 1878.
ROBINSON, MRS. M. S. P., December 13th, 1877.
ROOT, MISS LEILLA A., January 10th, 1878.

SARLES, MRS. H. W., January 10th, 1878.
SEAVEY, OSCAR F., January 10th, 1878.
STANDIFORD, MRS. N. D., January 10th, 1878.
SOULÉ, MARIA L., November 1st, 1878.

TITUS, FRANK H., January 10th, 1878.

WIDEMAN, JAS., January 10th, 1878.
WASHBURN, CHAS. E., November 1st, 1877.
WILLMER, JNO., December 13th, 1877.
WHITE, MRS. SARAH, November 1st, 1877.
WILSON, SARAH M., December 13th, 1877.
WRIGHT, C. C., November 1st, 1877.

SECOND GRADE CERTIFICATES.

BABB, MARY A., January 10th, 1877.
BERRY, JAS. H., January 10th, 1877.
BOWLES, J. H., January 10th, 1877.
BRADSHAW, MISS HALLIE, January 10th, 1877.

CHILD, LUCY E., January 10th, 1877.

DEANE, MISS K. B., December 13th, 1876.

HORTON, WILLIS B., January 10th, 1877.
HUNTER, ROSA V., January 10th, 1877.

KNIGHT, D. S., January 10th, 1877.

LOWE, MRS. A., January 10th, 1877.

ROCKWOOD, JOSEPHINE, January 10th, 1877.

SMITH, JUANITA J., January 10th, 1877.

WALDRON, S. A., January 10th, 1877.
WHEELOCK, MISS E. M., January 10th, 1877.
WRIGHT, MISS V., January 10th, 1877.

THIRD GRADE CERTIFICATES.

DAVIS, MISS DORA, January 10th, 1876.
DICKER, MEDA L., January 10th, 1876.
KIRBY, MISS ORA, January 10th, 1876.
LEEVER, MISS E. L., January 10th, 1876.
NORTON, CORA, January 10th, 1876.
PAULK, MISS U. A., January 10th, 1876.
PATCHETT, V., November 1st, 1875.
SUMMERS, MISS S. G., January 10th, 1876.

BOOK NOTICES.

EDUCATION ABROAD, AND OTHER PAPERS. By B. G. Northrop, Secretary of Connecticut Board of Education. New York and Chicago: A. S. Barnes & Co.

Two of the papers contained in this volume—"Should American Youth be educated Abroad" and "Legal Prevention of Illiteracy"—are already well known to the reader. Two of the remaining papers are on the importance of education to labor, to the industrial arts, invention, and the theoretical and practical harmonization of labor and capital. The remaining papers treat of culture and knowledge, study and health, and mental philosophy as the professional study.

It may be safely asserted that outside of the comparatively small number who are graduates of Normal Schools, very few teachers have paid the least attention to this most important study for teachers, a study without which, as Mr. Northrup justly observes, "teaching never can and never ought to rise to the dignity of a profession." We consider, therefore, Mr. Northrup's essay on "The Professional Study," though it is one of the shortest in the book, the most important article presented by him.

FREEMAN'S HISTORICAL COURSE FOR SCHOOLS. History of England; By Edith Thompson. History of Scotland; By Margaret McArthur. New York: Henry Holt & Co. San Francisco: Payot, Upham & Co.

One of the most promising signs in educational matters is the preparation of text books, not by professional bookmakers, but by the masters in the several fields of study. None but a profound special student is competent either to present the study in its proper proportion, or to secure accuracy. Instead of the half knowledge of cramming which the school-books for the most part have heretofore represented, we have now the breadth and accuracy of knowledge, which are the ripe fruits of original study.

In history, the task of preparing a series of text books whose object it is to put forth clear and correct views of history in simple language, has been assumed by Mr. Freeman, than whom perhaps no one is so well qualified for this task. Mr. Freeman himself has written the *Outlines of History*, reviewed in these pages some months since. We have now the *History of England*, and the *History of Scotland;* the former written by Edith Thompson, the latter by Margaret McArthur. Short histories on the other chief countries of Europe and America are in active preparation. All the volumes are prepared under the supervision of Mr. Freeman.

The two histories are brief, readable books, and are all that could be desired. We should like to see them find a place in every district library so that they may be used as reading books.

THE VOICE, AND HOW TO USE IT. By W. H. Daniel. Boston: James R. Osgood & Co. San Francisco: A. Roman & Co.

In a series of conversations, or rather of questions and answers between a teacher and a pupil, the author seeks to explicate the most important requisites to good singing. Nothing new is offered; the author simply aims to divest the subject of those technicalities by which the student is more frequently confounded than instructed. The book does not treat of the theory of music, but simply of what may be called the mechanical aids to singing, such as articulation, pure tone, position of the mouth, how to gain power, and certainty in singing, etc.

EARNEST WORDS ON TRUE SUCCESS IN LIFE, ADDRESSED TO YOUNG MEN AND WOMEN. By Ray Palmer. New York and Chicago: A. S. Barnes & Co.

This volume contains some of the counsels addressed to young men and women of the author's congregation. Characteristics of youth, causes of failure in life, self-culture, false views of life, the choice of a life-work, true greatness according to Christ, form the principal subjects of these discourses.

THE SCHOOL STAGE. A collection of juvenile acting plays. By W. H. Venable. Cincinnati and New York: Wilson, Hinkle & Co.

This little volume cannot fail to be of great service to those who are called upon, at some time or other, to give a school exhibition. The selection of pieces is very good, and better adapted to the actors than the usual pieces contained in "Speakers." The most valuable feature of the book is the ample suggestions respecting stage properties, etc.

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THE

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For the California Teacher.

ON THE PHYSICAL GEOGRAPHY OF CALIFORNIA.

BY J. D. WHITNEY.

ARTICLE II—INTRODUCTORY, CONTINUED.

Up to the year 1853, but little more had been accomplished, as has been seen, in the way of a geographical exploration of the region beyond the Mississippi, than the roughest sketching in of the great outlines of its physical features. Enough had been done, however, to indicate the magnitude of the task which was here set before the geographer and topographer. The discovery of gold on the Pacific slope of the continent, and the consequent rush of emigration in that direction, had given a new and immense impulse to western travel, and that which was before comparatively only a matter of scientific interest had now become one of national economical importance. The cry was for a railroad across the continent, so that the tedious passage around the Horn, or the costly routes by the Isthmus or across the "Plains," might be avoided. Congress determined to take an important step in the direction of the geographical exploration of the Far West, and the surveys for the determination of the best railroad route across the continent were organized. This

ERRATUM.—In the first article of this series, page 256, 17th line from top, for "adventurous Mr. Hunter" read "adventurous fur hunters."

was in 1853, and in the Spring of 1855 the main results of the various expeditions were laid before the public. Four principal lines had been surveyed across the continent between the parallels of 32° and 49°. Much of the work was done in a rough and inaccurate way, but a vast amount of geographical material was accumulated, as may be seen by consulting the thirteen great volumes of the "Pacific Railroad Reports." It is a curious fact, however, that no portion of the route actually followed across the continent by the present railroad line was explored by any of the parties engaged in this work, except the valley of the Humboldt River, which was then the main traveled emigrant route from the East to California.

The geographical results of the Pacific Railroad explorations were compiled into one general map, under the direction of Lieutenant (now General) Warren, in the War Department; and that map, when compared with Fremont's, will show what progress had been made towards a knowledge of the region west of the Rocky Mountains in the ten years interval between the two publications. "Warren's Map," as it is generally called, is on a scale of one three-millionth, or about forty-seven miles to the inch, which is far too small to allow much detail. Indeed there was not much detail to be shown at the time of its publication, for the topographical portion of the U. S. Pacific Railroad Survey was defective, and only valuable as a general reconnoissance. The routes were all in the valleys, the mountains were not ascended, nor was there any triangulation carried on, or even any accurate determinations of latitude and longitude made. It was mostly such general information as could be obtained by merely riding over the routes traversed, with compass and odometer, or estimating the distances traveled by keeping an account of the time consumed and guessing at the number of miles made per hour. A comparatively small additional expenditure would have added vastly to the value of the work from a geographical point of view; but the results must be had quickly, and there were few persons in the country at that time who had the professional training, and experience gathered in the field, which were absolutely necessary to secure good work in the topographical department.

Now that we know the positions of the different mountain ranges which traverse the State of Nevada, it is easy to judge

of the inaccuracy of the work done previous to 1860; and it is found to be true that one of Lieut. Simpson's three principal astronomical stations was nine miles out of the way in longitude; and that neither on his nor Beckwith's maps can the different ranges traversing the Great Basin be recognized and identified. The errors of position are greater than the width of the valleys intervening between the ranges.

The organization of the State Geological Survey of California was the beginning of a new era in the development of Western geography, and the topographical maps issued by this Survey comprise all that has yet been published of detailed work in the region west of the Rocky Mountains. But a large amount of other material is in preparation, and a portion of it will soon be published.

The "Survey of the Fortieth Parallel," a work authorized by Congress in 1868, and placed in the charge of Clarence King, with whom was associated Mr. J. T. Gardner, as principal topographer, both of them formerly attached to the Geological Survey of California, was the first step taken by the United States in the direction of accurate topographical work off the line of the coast. Under Mr. King's direction, a belt of country over a hundred miles wide, and extending from the eastern border of California across to the eastern base of the Rocky Mountains, has been accurately surveyed, both geographically and geologically, and the maps, when issued, will be found to be most admirable specimens of the cartographic art. This belt of exploration, striking, as it does, directly through the centres of the great mountain region of the West, embracing the Wahsatch and Uintah ranges, as well as the portion of the Rocky Mountains about the North Park, forms an excellent basis from which to spread similar work in both directions, north and south.

And this desirable continuation of a topographical work so well begun seems likely to be ensured by the action of Congress at its last session, remodeling the Geological Survey of the Territories by adding a geographical department, at the head of which Mr. Gardner has been placed. This skillful topographer has already commenced the careful mapping of the Rocky Mountain ranges, in continuation of the work done by him under Mr. King; and, unless Congress goes back on the work, we shall within a few years have topographical maps of the

Rocky Mountains to add to those of California and the Fortieth Parallel; and the survey will in time be extended so as to embrace the whole of the vast complex of ranges which fills our territory west of the 105th meridian.

From the work of the Fortieth Parallel Survey, that of Butler Ives, done for the Central Pacific Railroad, and the various United States Engineer reconnoissances in the Great Basin, it has been possible for us to put together quite a detailed map of Nevada, and one which, for the first time, exhibits the peculiarities of the topographical structure of that State with a reasonable amount of accuracy. A portion of Nevada is also represented on the State Geological Survey map of Central California, from the work of the Fortieth Parallel Survey, furnished in advance of publication by the kindness of the Chief of Engineers, General Humphreys. Of the map of Central California two sheets are already published, and a third will be ready within a couple of months. The completion of the fourth sheet awaits the action of the Legislature. Should this be favorable, the whole map may be got ready for issue by the middle of next year. With the aid of this and the State map, the teachers in California schools will be able to give their pupils a pretty clear idea of the topographical peculiarities of this State, and there is no part of the world where it is more desirable that the scholar should have some idea of the physical geography of the region he inhabits.

Having thus given some idea of the various steps through which we have arrived at our present knowledge of the geography of the western side of the continent, we will proceed to set forth the most prominent facts in the physical structure of the region in question.

The great complex of mountain chains which lines the Pacific side of the American continent, from Cape Horn to Alaska, is one of the most marked features of the earth's surface. Comparatively narrow in South America, although there attaining its greatest height, it gains rapidly in width after it has left the Isthmus of Panama to the south, and here, in the latitude which we occupy, attains its greatest development and complexity, having a breadth in an east and west direction of about a thousand miles. As the mass of mountains widens, it seems to lose the simplicity of structure which it had farther south, and geogra-

phers have been sorely puzzled to know how the various subordinate chains of which the whole is composed should be classified and distinguished. Different portions have, at various times, received different names, and some are well established and familiar to our school geographies. The name of "Rocky Mountains" has been in use for a century or more, and was applied to the whole mass of ranges west of the 105th meridian, at a time when nothing was known of their extent and complexity; but the designation is now limited to the eastern edge of the mountainous region in question, and especially to the portion which surrounds and embraces the system of the "Parks," and to its extension towards the northwest. The terms "Sierra Nevada," or "Snowy Range," and "Cascade Range," are also equally well known designations of the western portions of the mass; and the interior chains, lying between the east and west limits of the Rocky Mountains and the Sierra Nevada, have received various names, some of which are only of local value, while others are already introduced into the school books.

The absolute need of some term by which to designate the whole mass of mountains west of the 105th meridian, has been long felt, and the writer proposed, some years ago, in the Yosemite Guide-Book, that the name "Cordilleras" should be used for this purpose. This suggestion has already been adopted by some prominent geographers, and will probably come into general use in time. The word "Cordilleras," which is the Spanish for chains of mountains, was originally applied to the Andes and their continuations in Mexico. Now we have left off the word "Cordilleras," in speaking of the South American chains, and designate them simply as "the Andes;" so that the other part of the term, the word "Cordilleras," can be limited to the North American ranges. This is the more justifiable, because the great mass of the North American continuation of the Andes is much broader, and made up of a greater number of subordinate ranges (Cordilleras) than the South American.

In the next article we will proceed to describe the Cordilleras, indicating the groups into which they may be divided, and giving some of the most characteristic of their physical features.

[*For the California Teacher.*]

HINTS ON METHODS OF TEACHING.

Human consciousness consists of two distinct orders of manifestations. The first arises from perception, the other from conception; the one is the product of sense, the other of thought; the one is direct, the other reflex; the one is clear, vivid, the other more or less indistinct and faint; the one is objective, the other subjective; but by far the most important distinction, in an educational point of view, consists in their origin. The first order of manifestations arises directly from the activity of the physical senses, while the second order *is but a feeble repetition of the first.* These two orders of manifestation run along side by side; the one trenching upon the other in such a manner as to threaten entire exclusion of one from consciousness, or the other, as conditions and circumstances chance to be. In beholding new scenes and strange objects, the first order greatly predominates, while in reverie, it is nearly shut out from consciousness; yet either is rapidly set up, by a change of conditions. These two mental states are recognised by Sir Wm. Hamilton as Presentative and Re-presentative.

Since these two orders embrace the entire sphere of consciousness, and since the first gives rise to the second, we may obtain clearer views of methods of teaching, inasmuch as teaching consists in rendering the second order more vivid and clear, and thereby increasing the intensity and activity of the first.

Sensuous perception is the basis of all subsequent mental activity. No idea of color can be conceived by those blind from birth, or of melody or harmony by those who have always been deaf; the only avenues through which subsequent mental manifestations can come, are those furnished by the organs of physical sense.

The natural order of mental development is from the sensuous to the ideal, from the concrete to the abstract, from perception to conception. No modification of this law is possible, and consequently, the degree of development has been in each individual, all other things being equal, exactly proportionate to the conditions permitting the operation of the law. It is true, a vast amount of so-called knowledge is acquired, but since it is

not based upon that source from which all real knowledge must come, it is factitious and useless.

Our methods of teaching geography will illustrate my meaning. The perceptions upon which are based our knowledge of geography (as obtained in the schools) are derived from books and maps. You ask your pupil to tell where Africa is, and he will go straight to the wall-map and point it out; or ask him to describe a river, he will point to the mountain range in which it rises, and tell you in what direction and into what water it flows, without hesitation, and with an air of confidence which shows that he is perfectly satisfied with his knowledge—and *all this without the most distant conception of the reality;* in fact, *his thoughts never wander from the wall-map during the exercise.* The same may be said of the study of language. After years of painful study of grammar, the pupil goes forth with the same modes of expression, and is subject to the same influences of taste and style, as those who have made themselves familiar with classical literature, without these grammatical studies. And why? Because the bases from which his perceptions flow, are factitious and untrue. Among the earlier and more recent great thinkers of England, I am tempted to give the opinion of two—John Locke and Herbert Spencer. Mr. Locke says (Education, Vol. 2, Section 162), "Men learn language for the ordinary interests of society and communication of thoughts in common life, without any further design in their use of them. And for this purpose, the original way of learning a language, by conversation, not only serves well enough, but is to be preferred as the most expedite, proper and natural. Therefore to this use of language, one may answer that grammar is not necessary." *In the study of sociology* (Chapter 11th, Political Bias), in speaking of results being disproportionate to appliances, Mr. Spencer says: "It is so, too, with discipline, and with the agencies established for discipline. Take as an instance, the use of language. From his early days, the boy, whose father can afford to give him a fashionable education, is drilled in grammar, practised in parsing, tested in detecting errors of speech. After his public school career, during which words, their meaning and their right application, almost exclusively occupy him, he passes through a University, where a large, and often the larger part of his attention is still given to

literary culture, models in style, in prose and poetry being daily before him. So much for the preparation—now for the performance. It is notorious that commentators on the classics are among the most slovenly writers of English. Readers of *Punch* will remember how, years ago, the Provost and Head-master of Eton were made to furnish food for laughter, by quotations from a letter they had published. Recently the Head-master of Winchester has given us, in entire unconsciousness of its defects, a sample of the English which long study of language produces. If from these teachers, who are literally the select of the select, we turn to men otherwise selected, mostly out of the same highly disciplined class—men who are distilled into the House of Commons, and then re-distilled into the ministry, we are again disappointed." I can farther illustrate my meaning, in my own case. In my youth, while attending a Branch of the Michigan State University, among other branches, I studied Chemistry. At the close of the year, I passed a *creditable examination* in that study; I could give formulas for all the chemical compounds, and name the equivalents for all the acids and salts mentioned in the text book; but had my life depended on the issue, I could not have told the difference between Glauber's salt and saltpetre, had they been placed before me. I knew that the one was the sulphate of soda, and the other was the nitrate of potash, and that was all I knew about it. *My thoughts were confined wholly to the book.* I thought I understood chemistry, but I was undeceived by a painful and mortifying experience. I will say this, however, in behalf of the Institution, for which I have a high esteem, the University had been but recently established and was but poorly endowed, as was the case with all those Western institutions in early times.

We confine ourselves altogether too much to the text books, and too often allow our scholars to pass along satisfied with what they learn from them. All ideas, thoughts, memories, reflections and imaginations, must depend, for their truthfulness and vigor, their vividness and permanence, upon the perceptions of external objects and their relations. If these external objects are books and the learner has had no previous experience to serve as a basis to judge of their truthfulness, he stands upon a slender foundation. What is required is a supply of

suitable objects to produce the first order of manifestations. Knowledge obtained from books alone, is always *associated with the books.* How many study physiology without thinking that the vital processes they are learning are constantly going on in their own bodies? or of applying a single rule of hygiene!

The fact that so many have risen to eminence in spite of obstacles, and in the absence of school facilities, should teach us an important lesson. Instead of books and already discovered knowledge, they were compelled to grapple with unsolved problems; instead of learning formulas and drilling on rules, they were experimenting to ascertain the principles upon which the formulas and rules were based; they dealt in a world of realities; their perceptions being true, they reflected truth; having nothing but their own unaided efforts to rely upon, they employed them to the best advantage.

We may observe how feeble and indistinct the second order of manifestations is in our scholars, by requiring them to define words, or write out their impressions of the most familiar objects.

While we have a world of objects under our feet and around us, and in the heavens above us, do not let us think that there are no objects upon which to found a more rational and effective method of teaching.

The hints here given seem to indicate more practical and effectual methods of teaching, which may be somewhat elaborated on a future occasion. E. J. S.

PEEPS THROUGH THE DOOR OF A KINDERGARTEN. NO. II.

Little Marjorie is only five years old, and has never been away from her mamma a day, so I was obliged to do just what I liked to do that first morning of her Kindergarten life.

"Will you go with me, and sit close by me all the time?" was her first question, when she awoke.

"Yes, dear," I said, "I will go with you, and may go after you at one o'clock."

"No, but I want you to stay all the time with me."

When we went in the children were all assembled in the large

gymnastic hall, for devotions and opening exercises. Marjorie is very timid, and did not half like being set down in a little chair between two little girls of her own age. I was afraid she would cry, which is usually her last resort in trying circumstances, but just as I expected to see the first quiver of her lip, the little girl at her right hand, obeying a private sign from Miss Hamilton, moved her chair up closer to Marjorie, and took hold of her hand. The understanding that is often established between children of the same age, at a slight acquaintance, took place, and I had no further fear for my little girl.

After the singing and prayer, in which all the children took part, three chords on the piano brought them to their feet, and they repeated a short psalm in concert. I was much pleased to hear how distinctly each word was spoken. Then came some beautiful movement plays, which one must see to appreciate. The children, about a hundred in all, sat in a large semicircle about the room, and even the youngest among them were very quiet and orderly, though they all seemed to take an interest in the plays. There was one about a little bird flying to its mamma with a letter in its mouth, and a dainty little girl, with long golden curls, went flying about the room, waving her arms in a graceful movement like a bird. She knelt down at the feet of a boy, who sang in a clear voice, looking straight into her face all the while, something like "Fly away, pretty bird, for I cannot go with you." The words were sung first in German, and afterwards in English.

One of the prettiest plays was called the fishes, and five or six boys and girls ran about the floor with a slow gliding movement of the arms, like the swimming of a fish. The words were sung in German, and toward the last of the play the fishes swam up to Miss Hamilton, who sat at the upper end of the room, and sang a verse to her, she singing something in reply, the song closing with a bow from the children to their teacher.

One pretty play called "The Mouse," was represented by four little ones, three with joined hands forming a trap, and one, the youngest in the room, the mouse. She was a bright-eyed child, and looked roguish, creeping about with her hands on her knees, and stooping almost to the floor.

"O, mouse, beware! O, mouse, beware!
Go not into the corner there"—

sang the children, in pleading tones, shaking their heads at her; but the little mouse heeded them not, and crept slowly on toward the fatal trap.

"O, run away! Make haste, make haste!" they sang, louder than before, but still she crept on, just as a real mouse might be supposed to do, and when they sang:

"The pretty mouse—the careless mouse,
It ventures in the little house!"

the child crept into the trap, and stood up straight in the circle.

"Wipp, wapp!" sang the voices, and clap, clap, went the hands, and the trap was sharply closed upon the foolish mouse. Then came the last words of the song in pitying tones, from the children,—

"Poor little mouse! Poor little mouse!
How soon its days are ended!"

The beauty of these movement plays—so called by Frœbel, the founder of the Kindergarten—was the zest with which the children seemed to enter into them, and the seriousness with which they performed the parts. One of the plays impressed me especially with its utility. The teacher drew a perfect circle, a foot in diameter on the floor, and stood inside the line. Turning slowly around, she at last beckoned to one of the boys, who arose without a particle of noise, and went up to where she stood, shaking hands with her in a very polite manner. She took his seat, and he in turn, beckoned to a little girl, who shook hands with him and took his place in the circle.

The whole play was performed without noise, and then I noticed that nearly all the children wore slippers. How they managed it, I know not, especially in such stormy weather; but I suspect that the slippers were all kept in a closet, opening out of the hall, and they were put on after the children came in the morning. I appreciated the good use of this beckoning play, when I remember a little incident that took place, last week, at my own house. An old friend had called to see me, one who had been in a foreign country for many years. He had never seen Marjorie, and when she came into the parlor, she stood shyly at the door.

"Come here, my child," said my friend, "and shake hands with me." She hung back, and when I had succeeded in making her come to him, she very awkwardly gave him her left hand, and made no movement toward a hand-shaking. I was mortified, as much at my own negligence in the matter, in that I had never taught the child how to perform the simple courtesy, as at her want of politeness; but looking at this simple play I said to myself, "That will never happen again, for my little girl will learn at the Kindergarten to be perfectly polite to her schoolmates, and will naturally be so to other people."

Miss Hamilton told me that she had the greatest faith in these plays, to make children easy and gentle in their manners, and physically, mentally, and morally healthy.

After the movement plays the children marched to the next room for their various occupations. Marjorie would not let me leave her, so I went to the table where she was to be, though I would have preferred Miss Hamilton's table, having become interested in those children. The little ones who were to be Marjorie's companions were all, or nearly all, under five years of age. Marjorie was one of the youngest. She stood by my side after the others were seated looking at them, with interest, but was altogether too timid then to take the place that had been assigned her.

"Come," said the teacher, at last, "you shall sit close by me, Marjorie, and you will soon learn to do just as you see the others do;" and she lifted the child over the low back of the long bench, and took her own seat at the head of the table. As soon as she was in her place every pair of hands, except the little new scholars, were crossed on the table,—the teacher setting the example. Then she looked smilingly around at the bright faces.

"It is a beautiful morning, isn't it, children?"

There was a cordial assent to this remark from the little listeners.

"Do you like pleasant weather?"

"O, yes'm, yes'm," they exclaimed.

"What shall we do to make it pleasant in the Kindergarten, to-day, I wonder," she said, looking from one to another. "If any of you can think of any ways, you may raise hands."

From some of the very singular replies given to this question, I judged that it was not the first time it had been asked.

"What do you say, Mamie?" to a little four-year old, who sat at the further end of the table, and whose impatient hand had been up for some time waiting her turn.

"I am going to try and not get up on the table once this morning," announced the mite, with great earnestness.

"That is good! And you, Charlie?"

"I guess I can keep from saying 'aint,' and interrupting,"—he stumbled a little over the long word,—"when some one else is talking."

"I won't ask to sit by you, if anybody else wants to," said the child who sat next her.

"I like to hear you say that, Lizzie," replied the teacher. "If it is a good thing to sit by me, as some of you think it is, you should be willing to share the pleasure with your friends."

One little boy said he would try to remember to say "please" whenever he wanted anything, "and thank you, if I get it," he added, without meaning to be funny.

The teacher then brought from a cupboard a pile of boxes and placed them on the table before her. A box was passed to each child, who immediately placed it in the upper right hand corner of his or her square. I was amused to see with what serious care these little ones performed the simple act, looking at the box from every side, to see that it was exactly straight; and I think I learned again the lesson that can never be too well learned, as I watched the small hands—that the simplest thing, if it is worth doing at all, is worth doing well. The teacher had a box, too, and at "one, two, three," every box was brought forward, ready for use. The boxes were small, wooden ones, with sliding covers, and these were removed by count, the children keeping perfect time.

In less than a minute the covers were replaced, and the boxes put in their corners with the same accuracy as before, having emptied themselves of eight little wooden cubes. It was marvelous to me—how sixteen children could, in so short a space of time, have accomplished this feat in such perfect order, for as I looked along the table, each pair of hands was crossed in front of the eight little cubes, so placed that they covered exactly four squares in the center of the large square, and this

had been done by turning the box over and taking it off from the cubes. Not one had been re-arranged, yet there they stood in perfect order. It was something wonderful, and from such children too.

The teacher held one of her blocks in her hand and asked some questions concerning its shape, properties, etc.

"How many corners has it?"

"Eight," they all replied.

"How many edges and sides?"

"It has twelve edges, and six sides," was answered.

Then followed an interesting conversation about wood, in which all the children took part and asked questions. At last the teacher said:

"You may make anything you choose, now."

Lo! what a change was wrought before my eyes. I saw no longer a group of school children at their lessons, but sixteen little men and women at their busy work. The Kindergarten table was a table to them no longer, but the wide ocean, the river, the round earth, the sky—anything their fancy pleased. The eight little cubes had become living men, and women, and children—stars, ships, kites, railroads, mountains—anything—everything they wished. It was a delight to hear the hum of eager voices, and watch the busy little fingers. Small carpenters were they—teachers, painters, engineers, merchants, sailors, as really so, for the time being, as are those who follow those avocations in life.

A tinkle from the little bell at the teacher's hand brought them all to order, and then the first one at the end of the table took the pointer and stood up to explain. Four cubes were placed one upon another to represent a mountain. Two more set up against it made a ladder, which the boy said was in a steep place; one more represented a guide showing the other and remaining cube, a man from New York City, to the top of the mountain. It was very high and covered with snow all the year round. If he had had three more cubes, he would have made the other men who went up, "for there were four that time in the party."

The next child, a lovely little girl of three and a half years, but very old in face and manners I thought, had a volcano, with a hole in the top for the crater. One boy had a long train of

cars, with the engine just getting up steam, and he wouldn't have been a boy if he had forborne to toot just as the train started. Teacher and children were evidently accustomed to vocal illustrations of this kind, and the only notice taken of the noise was a long stare from my little Marjorie, who was unused to such children ; but I forgot myself—they had ceased to be children for the time. During the whole exercise, I had not seen a word or look that would seem to indicate that they were playing. It was serious business to them, and the explanations were given with great earnestness and perfect faith. I must leave it for another paper to tell what more objects of interest I saw in that real world, albeit made with blocks.—*Rural Home.*

TEACHING VS. HEARING LESSONS.

BY H. B. BUCKMAN, A. M. BUFFALO, N. Y.

To one who is familiar with schools, the first glimpse of a class room, the first movement of a class, almost the first word spoken, reveals the character of the work done in it. Power and skill, or the lack of these, are shown in everything done, and felt in the very air. Both manner and results bear the unmistakable hand of a master, or the equally clear signs of an apprentice or trifler. And this whether the work of a class be a "common" or a "higher" subject; whether the lesson of the day be a familiar one or a new topic. A long visit may increase interest in the class or the subject, and may disclose the source of power, but the *fact* of good teaching, in distinction from the mere hearing of lessons, is apparent on the face of things. It may not be possible to put all the points of this difference into words, for we often see and feel the force of that which we cannot state as a formal precept for another to follow; but some elements of it may be separated from the complex whole.

I. It is immediately apparent that class and teacher now come together for some *definite purpose.* Each expects something of the other. The pupil is under a sense of responsibility to the teacher and the teacher to the pupil, and each will hold the other to his duty. There is an air of business, an attitude of attention, a silent but effective demanding, or rather expect-

ing of attention and effort, and of preparation of all that was required, together with a manifest readiness to be patient without sacrifice of thoroughness, to be rigid in requirements and conciliatory in manner, that give appearance of results. No time is wasted in delay, in dawdling, in asking and answering needless questions. Everything needed in the class has been brought to the class, and everything required for use—map, pointer, crayon, *paper and pencils*—is at hand. No time is wasted in getting into order, or discussing "how far we went yesterday," or whether "this was to be skipped," or in reminding the teacher that he promised to do this and that left over from last week. The teacher and the class have met for something understood by them both, and then proceed at once to do it.

II. *The teacher knows the lesson*, and knows it in such a way that he could recite as he requires the pupil to recite. He does not need to keep his eye on the book and his finger on the place. *He can do without a book*, except as problems may be taken from it, or sentences given for analysis, or as it contains the text to be translated. It more frequently lies on the desk for occasional reference than is followed letter by letter. It is evident that the teacher is master of that part of the subject, that he sees how it grows out of a preceding part and prepares the way for what follows, and he has estimated the relative importance of it, and just how much time he can afford to spare upon it. His questions show this; his explanations clear, right to the point, sharp and sharpening, confirm it; the manifest confidence of the class in his statements and the eagerness with which they seize and appropriate instruction make it plain that they are in the habit of receiving positive statements which will bear close questioning, and which will apply directly to the case in hand. Questions asked are for information, and not "to catch the teacher;" the pupil knows that he will be expected to be sure of what he claims to understand, and that the teacher will not be satisfied until every point is made clear to all.

III. Teaching does more than to ask all the questions in the book, more than to go all round the class in order every day, more than to call for all the words of the text. It finds out, now in this way and now in that, *how much the pupil knows*, not how many words he can say; what application of knowledge he

can make, not merely how many rules he can repeat. The teacher's knowledge is of things, not of words; he sees things in their uses and in their relations, and they become to him signs not of learning only, but of wisdom as well. And as face answers to face in the water, so the knowledge of the pupil, when a subject is finished, is seen, though in different degrees, to answer to his own knowledge.

IV. The teacher's knowledge of a subject is also of such sort that it gives him the basis of all needed explanations and illustrations. He knows where difficulties lurk and how they can be met. He anticipates that such a step may be too much to take at once and divides it into two. He sees the need of some special illustration to aid in grasping a principle and he inserts what will give necessary light. He knows how much the senses enlighten the mind and he puts a hard question with some *sensible* answer. He does not expect a child to understand the "book definition" of *horizon*, unless he has first called attention to the fact that the earth and the sky *do* appear to meet at a certain distance from the observer. He does not suppose that many learners will "know for certain" how net-veined leaves differ from others unless the two have been compared, nor that they will know how "to write a composition" without information about the subject of it. He has had experience of all the trials of a learner and is ready to "bear a hand" when others ask for it. You may see how quick he is to vary a question, to add to an explanation, to lead the pupil into the light, to help him to perceive how this step follows that. His fertility of resources will not please more than his readiness to notice just when those resources must be used, and when the pupil should be left to his own devices.

V. It *compels*—or shall it be rather said, *inspires*—pupils to use their own powers, and does not allow them to suppose that all the heavy loads are to be carried by the teacher, but of all, the pupil must carry his part, and of most, the whole. The pupil studies, the pupil wrestles with difficulties, the pupil tries and tries again, and in the end, the pupil gains the victory. He is aided, he is guided, he is encouraged, and that is all; he does the work, for he is held up firmly to the work, and not allowed to flinch. Just here, perhaps, more than anywhere else, the power of a true teacher is shown. When a child says, "I don't know"

the hearer of lessons simply *tells* him; the teacher compels him to look, at least, for the truth. When the child says, "I can't do this," the former does it for him; the latter sets him at work to do it for himself. When the child is indifferent and careless, the one weakly does his task for him or lazily lets it go undone; the other, by means as various as the resources of a fertile and earnest mind, stimulates, provokes, urges him to do his own task, for he will accept of no substitute.—*N. Y. Ed. Journal.*

PROFESSOR LOUIS AGASSIZ.

In all America there is no private citizen whose death will touch the chord of sorrow in so many hearts as will mourn Professor Agassiz, who died at Cambridge, Mass., December 14th. A grand simplicity of character, and earnest warmth of feeling which the severe studies of his life never abated, would have made him a man not easily forgotten by those who have known him, if well-earned and wide-spread fame had not waited upon his labors. Even those who have formed their notions respecting him from his writings, have been impressed by the depth and solemn fervor of his words, when he stepped aside from the drier details of science to its broader generalities. At the lecture desk, though handling themes that rarely interest any but professional students, and speaking with what might rather be termed a foreign enunciation than accent, he never failed to kindle in others the enthusiasm that glowed within him.

Some friends prepared a social reception for him one evening at Washington. He was asked to hold himself in readiness. "You will not ask me to make a speech?" he inquired. "Oh, no!" was the reply, "we only want you to come and beam upon us." The reception was a great success. "Agassiz," said the hostess afterward, "merely shook hands. There was nothing formal; but he beamed on everybody with such a pleasant smile that it seemed as if he was diffusing happiness through the whole company."

The secret of the great personal influence exerted by Agassiz, and which enabled him to secure from wealth the assistance that his extensive scientific undertakings required, lay princi-

pally in his singleness of soul. He had but one object ever in view, and other matters were not merely subsidiary, they were all but forgotten. To science he was not only an humble student, a ministering priest—he was a self-abandoning devotee. One expression indicating this characteristic has been often quoted. A business man was urging him to become a partner in some commercial undertaking in which the technical knowledge of Professor Agassiz was to be regarded as an equivalent for the capital and mercantile experience of the other members of the firm:

"You would make any amount of money in the business," said the man of dollars.

"I have no time to make money," replied the man of science.

Somewhat similar is another incident, which he mentioned in private conversation, with the request that it should not be repeated with names. A publishing firm wrote to him urging him to write a book on Natural History for use in schools, and offering him a large pecuniary inducement. "I wrote them," said he, and his eyes sparkled with indignation, "that I was not the man to do this kind of work. And I told them, too, that the less of this work that was done, the better. It is not school-books that we want, it is students. The book of nature is always open. All that I can write and say shall be to make them study that book, and not pin their faith to any other." The self-denial of Prof. Agassiz may be better appreciated when the fact is mentioned that the salary of his professorship was only $1,500 per year.

Prof. Agassiz was simple in dress and mode of living. His figure was somewhat under the medium height. His massive head, slightly inclined forward, rested on a thick-set and sturdy frame. The natural expression of his face was of cordiality and good humor. His large eyes of bluish gray were ever ready to brighten with kindly interest when a student was seeking information, or telling of what might, perhaps, be a new discovery. But whether the thought presented was new or old, Prof. Agassiz rarely failed to bring forth from the storehouse of his memory some illustrative or cognate fact, investing the subject with a broader significance. His lectures and public addresses were, with few exceptions, extemporaneous, or at all events largely dependent upon the inspiration of the moment for their forms

of words. He was a fluent speaker, using English, though evidently not a vernacular tongue, with ease and accuracy; hesitating, or rather pausing sometimes for a moment, not as if there was any deficiency of thought or words, but as if he was in doubt which to select from a throng of ideas presenting themselves.

We have but space for a brief account of the crowded labors of his life. Louis John Rudolph Agassiz was of Huguenot descent, born at Motiers, Switzerland, May 28, 1807. His lineal ancestors for six generations were clergymen, his father being pastor of the Protestant parish of St. Imier. His mother, the daughter of a physician, superintended his education in early youth, and for many years his studies had in view the medical profession. After leaving the college at Lausanne, he went to the medical school at Zurich and afterward to the University of Heidelberg, where he studied anatomy and physiology under Tiedemann, zoology under Leuckart, and botany under Bischoff. At the age of 20 he entered the University at Munich. Already his studies were especially advanced in the direction in which he subsequently became a leader, and with Dollinger, at whose house he lived, he made special investigations in the embryology of animals. Wagler, Oken and Martius are named among the distinguished naturalists from whom he obtained instruction. Rapid progress was made by the students of Munich under such tuition; his companions, like himself, were absorbed in scientific researches, and he began at that time the publication of brief treatises on special subjects. Upon the return of the scientific exploring expedition from Brazil, Agassiz was called upon to compile for publication the discoveries relating to fishes, and it was while engaged in this work that his destiny as a naturalist was determined, and he relinquished the study of the healing art, after graduating as Doctor of Medicine at Munich, having in the same year obtained the degree of Doctor of Philosophy at Erlangen.

In his researches in the museums of Europe while engaged in the study of fossil fishes, he obtained the acquaintance and friendship of Cuvier, then in the zenith of his fame and surrounded by a bevy of pupils, most of whom have long since become famous. Among them were Owen, the great comparative anatomist of England; Milne-Edwards, the great French

zoologist; Rudolph Wagner, and Johannes Muller, German physiologists, the last-named one of the most eminent men of the present century, and the not unsuccessful antagonist, in a great scientific controversy, of Baron von Liebig. The influence of Cuvier upon Agassiz is traced by many in the views with which the latter is identified, and it has been said, not without good cause, that the mantle of Cuvier has fallen upon him.

The science of fossil ichthyology is almost wholly due to the labors of Agassiz; he laid its foundations and built upon them a vast amount of erudite information. Aided by the liberality of Baron von Humboldt, he was enabled to publish his great work on this subject; it is in five volumes, with a folio atlas containing 311 plates, about 1,000 species being completely, and 700 partially described and figured. A new order of classification was brought forward as the result of these investigations, which was far in advance of anything previously attempted. On this work his fame as a naturalist rested securely; but it was destined to receive a great accession from his studies during his vacations, which he spent in the Alps. Thirty-seven years ago he began to unfold the glacial theory, meeting on every side the most violent opposition. But as years have rolled on, and proof after proof has been brought forward of the existence in geologic eras of a vast ice sheet which overspread the continents and left its records in the rocks, the theory has become an accepted fact with most men of science, and has formed the basis of new accessions to knowledge of still greater importance.

In 1839–40 Prof. Agassiz published his work on the Fresh-Water Fishes, followed by the *Nomenclator Zoologicus*, which was an index of names and classification for the entire animal kingdom, accompanied by the *Bibliotheca Zoologiæ et Geologiæ*, containing a list of authors mentioned in the former work, and notices of their writings. To this day the *Nomenclator* remains as a standard work of reference indispensable in every scientific library. *Etudes sur les Glaciers*, published about this time, foreshadowed the greater work of 1847, the *Systeme Glaciere*. Before he left Europe he had expressed very clearly the views which he never afterward abandoned on the subject of the creation of animal life. As these views were set forth in detail

in his lectures last Winter, it is not necessary here to go into detail concerning them. His uncompromising hostility to the doctrine of evolution never lost an opportunity for expression, and his reputation as an ichthyologist and as the father of the glacial theory, was scarcely greater than as the bitter foe of Darwinism.

In 1846 Prof. Agassiz came to this country, and shortly afterward identified himself with its scientific interests by assisting in the labors of the Coast Survey. The next year he accepted the chair of zoology and geology at Harvard, and thenceforth spoke of himself, and was proud to be considered, as an American. He made a series of scientific expeditions in subsequent years, along the coast, and to different localities on the lakes and rivers and among the mountains of the United States, and his success as a lecturer at intervals in our great cities gave an impulse to science in this country which it had never before received. His expeditions to Lake Superior in 1848, and to the Florida Reefs in 1850, produced most valuable results. A Boston merchant in 1865 defrayed the expenses of the celebrated expedition to the Amazon region, in the course of which he ascended that great river to the frontiers of Peru. It was upon this expedition that Prof. Agassiz saw and described the celebrated "walking fish"—a fish which at certain seasons of the year uses certain spinous fins as legs, and actually walks up the river bank, dryshod. An immense quantity of valuable specimens for the Cambridge museum, and large accessions to zoological knowledge accrued from this expedition. The narrative of the voyage of the Hassler around Cape Horn, 1871-2, was rendered familiar to Tribune readers by copious correspondence. This expedition also assisted largely, both by the collections made and the interest excited, in building up the institutions which were under his charge. The chief of these, the Museum of Comparative Anatomy at Cambridge, is in its specialties the most extensive institution of the kind in the country, and Prof. Agassiz himself has frequently declared that in very many particulars it is far ahead of anything in Europe. On his return from the Hassler expedition in the latter part of the Summer of 1872, the City of San Francisco gave him a public reception. In an address which he delivered before the California Academy of Sciences, on that occasion, he took high

grounds concerning the need and value of scientific training and research, setting forth not only the need of the State of an educated and practiced corps of investigators, for the sake of her material advancement, but insisting that the welfare of society, and the morals and religion of the people, were dependent upon the progress and direction of scientific study.

We can name but a few of the honors which were showered on him by scientific institutions and learned societies. The Edinburgh and Dublin Universities conferred their degrees of LL. D. upon him. He was made Professor of Zoology and Geology at Cambridge, in the scientific school founded by Mr. Abbott Lawrence, Professor of Comparative Anatomy in the Medical College of Charleston, S. C., and a non-resident Professor in Cornell University, in this State. He was a member of the French Academy of Sciences, of the Royal Society of London, and of our own National Academy of Sciences; he held the Monthyon prize and the Cuvier prize from the Paris Academy; the Wollaston medal from the Geological Society of London, and the medal of merit from the King of Prussia.

He added to his other enterprises last Summer the Natural History School at Penikese, the island presented and the school endowed by the liberality of our townsman, Mr. Anderson. The responsibility of all these great enterprises weighed upon him, and perhaps hastened the conclusion of his labors. There is none to fill his place. A great light has gone out in the halls of science, and the remaining torches burn but dimly. But the work that he has accomplished remains, and the vast accessions to science which are due to his efforts will be the most enduring of monuments.—*New York Tribune.*

SCIENCE IN OUR COMMON SCHOOLS.

There is not an inventor or mechanic who does not suffer for want of a good elementary training in mathematics and the sciences; and yet, notwithstanding this notorious fact, it seems impossible to introduce such a reform in our school education as will successfully remedy the evil. The chief difficulty in the way of reform is in the supply of teachers. Our training schools have raised up teachers whose minds run in the same groove, and who have no mental switch by which they can turn off on to a new track. The custom of learning everything by rote

and reciting like a parrot, has become so imbedded in our system of education, that it seems almost impossible to find any explosive sufficiently active to blow it up, and no jack-screw or hydraulic ram is powerful enough to move our Boards of Education from their firm foundations. But as the continued dropping of water may wear away a stone, we propose to keep adding here a little and there a little, until some impression has been made and some good has been accomplished. It is probable that we must look to the West for our chief support in the war that it is proposed to wage against the relics of monastic education. They have a practical country, and common sense is allowed to have due weight in questions of all kinds. We are, therefore, not at all astonished to learn that, at the University of Iowa, instead of teaching physics, chemistry, geology and astronomy, by oral recitations and unillustrated lectures, they have established laboratories and work-shops, where practical things can be practically learned, and theoretical ones can have all the weight that properly belongs to them. The trustees of the Iowa State University have resolved that the only way in which instruction in science can become thorough is by placing the elements of physical science *at the very beginning of the course.* They do not propose to wait until the pupil, by droning over dry facts and abstract principles, has acquired a disgust for every branch of knowledge, but think it wiser to pursue the natural method, and begin when the mind is anxiously inquiring into the cause of things, and the boy takes his watch apart to see what makes it go. The old-fashioned way was to give the boy a sound flogging, to take the watch away, and make him learn by rote the principle of compensating balance wheels. "My dear boy," says the teacher, "the duration of an oscillation depends on the radius of the wheel, the mass of its rim and the strength of the spring;" which, of course, is very intelligible to the lad, and would enable him at once to construct a new watch.

Common sense would dictate the propriety of showing up the parts of the watch, and by degrees expounding the principles upon which the construction is based. Theory and practice is what we want, and not either of them alone. Technical instruction alone will not result in the advancement of science, but that, together with a thorough training in the phenomena of nature, will lead to great progress.

TEACHING HOW TO STUDY.

We can all of us call to mind failures in school that befell us because we did not know how to grasp our work. We groped blindly in the dark, though there was light enough which we could not find. We can see where a few words of suggestion would have lighted up many weary days of study, and made that a delight to us which was at times an irksome duty.

Now, teachers have something to do besides inciting to work and drawing out the results of past study. We must guide, warn and instruct in processes of study, if we are to do the most possible for those under our charge. Just as a mechanic teaches the apprentice how to use the chisel, saw and plane, or the drill-sergeant shows the recruit how to handle the knapsack and musket, so we are to teach pupils how to make profitable use of the apparatus for study which we place in their hands.

A child nine years old, who knows the multiplication table and can read pretty well, is going to begin written arithmetic. He brings his new book to school. His class is brought before the teacher and is told to get the first two pages for the next day's lesson. And they are, with no note or comment, sent to their seats to get their lessons. They find words whose meaning they cannot understand; they see a discussion of some abstract principle wholly beyond their comprehension; they can make no sense of it; the lazy ones give it up, and the diligent try to commit the words to memory. The recitation, when it comes, is a mere answering of questions found perhaps at the bottom of the page, or a repetition of the words in the book. So pupils drag on through term after term, and do not know what they are about. Now, this is not teaching. It is all a sheer farce. It is not the fault of the book at all that the pupil does not understand the subject when he has committed the book to memory. No book can possibly be written that can convey to the mind of a young person an adequate idea of the first principles of arithmetic or grammar, or any one of the natural sciences. It is the business of the teacher to interpret the book to the learner. So, instead of assigning a lesson and leaving the child to work upon it with no explanation, he ought to read the book over with the learner, call up the meaning of every word,

explain and illustrate the meaning, point out the main principle and show how to get at that principle from the language of the book.

In the first ten lines of one of our best arithmetics are these words: *science, art, computation, unit, collection, employs, operations, different, combined, variously, expressing, relations, figures, symbols, notation, numeration, giving rise.* It is no objection at all to the book that the pupil does not know the meaning of these words; it is a great objection to the teacher that he does not always take time to explain the meaning of the words before he requires the pupil to commit them to memory. We want to teach how to study intelligently, how to gather up all valuable material that lies in the way, and apply it to their own culture. You can put a man in the cars, close the blinds, and send him from Boston to Springfield in three hours. He has gone his journey and reached his goal, but he couldn't find his way back, nor could he describe any of the country he has passed through. But put him where he can see all about him, tell him what the varying surface of the country means and what the population are about, and he is in the way of making some fresh discoveries for himself, in addition to the knowledge thus acquired. Many youth go through school boxed up in a car; in the din and rattle they don't know where they are, or which way they are going, and when they reach a stopping place they know it only because they are told of it. Every lesson should be carefully scanned by the teacher before it is assigned. Frequently it will be best to omit something on account of lack of time, or the incapacity of pupils: this should be pointed out. There will be need of explanation of certain hard words and obscure passages; this explanation should be given; the lesson will often be studied to the best advantage in an order different from that laid down in the book; there will be need of some hints about the best way to come at the lesson and the time that ought to be given to it, and many other things that will suggest themselves to the teacher. In many branches a fourth part of the time devoted to the recitation can in this way well be given to a preparation for what is coming.

To what is here recommended it will be said, in objection, that there is discipline in finding out for ourselves the best methods and moulding our obstacles into implements without help or advice from others, and that this helping process weakens the pupil and destroys his self-confidence. It is not proposed to lower any standard of diligence or thoroughness or self-reliance or self-restraint. It is only pleaded that the best path of the

pupil ought to be pointed out for him, and that he ought not to spend the best years of his life in merely feeling after it. Besides, with the help here advised, there is quite as much scope for invention and incentive to progress as there is when but little help is given, and more too. The inventive genius of the present age is quickened by the fact that men are born into a world of rapid progress, and early made familiar with things that would have astonished their grandfathers beyond measure. If we want a boy to become a skillful artisan, we place him where he will see most of those things done that he is to learn. This leads him to the greatest acquisition and skill; so let us set our pupils where they can see what has been done, and what remains to do, describe the field in which they are to work, and guide them over it; direct them to hard work and patient investigation; but let this work, this investigation, carry them forward as far as possible, instead of simply bringing them to the entrance of the way they are to tread.—*Massachusetts Teacher.*

How Savage Nations Count.—The history of the development of the different sciences points clearly to the mode in which they should be taught. The human mind acquires knowledge by its own unaided efforts in the same way that it best acquires it from books and teachers. A child among us is the man of a barbaric stage of civilization. The following extract from Mr. Galton's Tropical South Africa, will exemplify this doctrine with respect to arithmetic:

"When the Dammaras wish to express four they take to their fingers, which are to them as formidable instruments of calculation as a sliding rule is to an English school-boy. They puzzle very much after five, because no spare hand remains to grasp and secure the fingers that are required for units. Yet they seldom lose oxen; the way in which they discover the loss of one is not by the number of the herd being diminished, but the absence of a face they know. When bartering is going on, each sheep must be paid for separately. Thus, suppose two sticks of tobacco to be the rate of exchange for one sheep, it would sorely puzzle a Dammara to take two sheep and give him four sticks. I have done so and seen a man put two of the sticks apart, and take a sight over them at one of the sheep he was about to sell. Having satisfied himself that one was honestly paid for, and finding to his surprise that exactly two sticks remained in hand to settle the account for the other sheep, he would be afflicted with doubts; the transaction seemed to come out too "pat" to be correct, and he would refer back to the first couple of sticks; and then his mind got hazy and confused and wandered from one sheep to the other, and he broke off the transaction until two sticks were put into his hand, and one sheep driven away, and then the other two sticks given him, and the second sheep driven away."

DEPARTMENT OF PUBLIC INSTRUCTION.

Just as we are going to press, the Supreme Court has decided the case of Ward *vs.* Flood, involving the right of negro children to attend the public schools. The Court decides that the Act of our Legislature establishing separate schools for colored children is not in violation of the Federal Constitution; but the Court adds, that unless such separate schools be actually maintained, colored children have a legal right to attend the schools for white children, and cannot be excluded therefrom.

Section 1,542 of the Political Code, which prescribes that "No person is eligible to the office of School Superintendent who is not a professional teacher, possessing a first-grade certificate," has been repealed.

The semi-annual apportionment of State School funds will not be made until the first day of March.

OFFICE SECRETARY OF BOARD OF EDUCATION,
San Francisco, Cal., Jan. 26, 1874.

HON. H. N. BOLANDER, Superintendent Public Instruction:

Dear Sir—The annexed statistics are reported to you by the Board of Education, in compliance with Sub. 2 of Sec. 2 of "An Act to provide for the Support of the Common Schools of the City and County of San Francisco, and to define the Powers and Duties of the Board of Education thereof," approved April 1st, 1872.

Very respectfully,

GEO. BEANSTON, Secretary.

STATEMENT

Showing the Names of the Schools in the Department, the Whole Number of Pupils taught during the Year 1873, *and the Average Daily Attendance.*

SCHOOLS.	Whole Number of Pupils Taught during the Year.	Average Daily Attendance.
Boys' High	262	147
Girl's High	478	326
Denman Grammar	988	705
Lincoln Grammar	1,072	811
Rincon Grammar	477	374
Washington Grammar	555	392
Union Grammar	528	389
Broadway Grammar	589	443
Spring Valley Grammar	777	505
Hayes' Valley Grammar	993	761
South Cosmopolitan Grammar	546	503
North Cosmopolitan Grammar	596	499
Valencia Street Grammar	819	641
Eighth Street Grammar	917	695
South San Francisco	412	260
Potrero	278	187
Bush Street Primary	743	516
Lincoln Primary	1,070	653

REPORT ON SCHOOL ATTENDANCE—Continued.

SCHOOLS.	Whole Number of Pupils Taught during the Year.	Average Daily Attendance.
Taylor Street Primary	614	392
South Cosmopolitan Primary	996	692
Model	500	406
Mission Primary	890	515
Market Street Primary	1,168	690
Tehama Primary	1,110	707
Broadway Primary	751	425
Geary Street Primary	334	202
Spring Valley Primary	338	204
Fourth Street Primary	900	613
Silver Street Primary	1,045	626
Pine and Larkin Street Primary	749	487
Tyler and Jones Street Primary	459	312
Greenwich Street Primary	841	519
Hayes' Valley Primary	653	441
Union Primary	676	432
Shotwell Street Primary	890	603
Pine Street Primary	187	104
Eighth Street Primary	1,008	523
Powell Street Primary	824	454
Tyler Street Primary	328	205
San Bruno	277	156
West End	85	53
Fairmount	203	97
Laguna Honda	70	51
Point Lobos	56	25
Ocean House	39	30
Vallejo Street Colored	84	37
Fifth Street Colored	16	9
Evening	2,504	573
Totals	30,695	19,390

The Day Schools were kept open ten months during the year, and the Evening Schools, eight and a half months.

STATEMENT OF THE FINANCES

of the Public School Department, for the Year ending December 31, 1873.

SCHOOL FUND.

RECEIPTS—		
From Taxes	$482,494 25	
" Poll Taxes	37,746 80	
" State Apportionment	93,572 48	
" Rents	100 00	
" Sale of old Stove-pipe	15 00	
" Salary refunded	54 80	
Total		$613,983 31
Cash on hand, January 1, 1873		5,382 19
Total Revenue		$619,365 52

DISBURSEMENTS (Demands audited)—		
For Teachers' Salaries	$445,148 82	
" Evening School Teachers' Salaries	9,680 25	
" Janitors	23,831 83	
" Census Marshals	1,679 50	
" Fuel and Lights	8,517 42	
" Water	171 00	
" Repairs to School-houses	51,221 56	
" Furniture	30,250 62	
" School Text-books	7,521 35	
" Stationery, School Incidentals and Printing,	20,061 75	
" Rents	15,464 23	
" Incidental Expenses	6,821 00	
Total Demands audited		$620,369 34
Demands paid, audited in 1872		13,604 16
Total Expenditures		$633,973 50
Total Revenue		$619,365 52
Total Expenditures		633,973 50
Excess of Expenditures over Revenue		$14,607 98

SCHOOL FUND SPECIAL.

Cash on hand, January 1, 1873	$10,487 59
Paid Balance due on the three 18-Class Buildings	2,542 75
Cash on hand, January 1, 1874	$7,944 84

MEDICAL COLLEGE OF THE PACIFIC.

MEDICAL DEPARTMENT OF UNIVERSITY COLLEGE.

FACULTY.

A. J. BOWIE, M.D., Emeritus Professor of Surgery, and President of the Faculty.
J. F. MORSE, M.D., Emeritus Professor of the Principles and Practice of Medicine.
J. P. WHITNEY, M.D., Emeritus Professor of Physiology.
HENRY GIBBONS, M.D., Professor of the Principles and Practice of Medicine, and Clinical Medicine.
L. C. LANE, M.D., Prof. of Surgery and Surgical Anatomy, and Clinical Surgery.
EDWIN BENTLEY, M.D. Prof. of Descriptive & Microscopic Anatomy & Pathology.
C. N. ELLINWOOD, M.D., Professor of Physiology.
ADOLPH BARKAN, M.D., Professor of Ophthalmology and Otology.
THOMAS PRICE, M.D., Professor of Chemistry and Toxicology.
J. H. WYTHE, M.D., Professor of Microscopy and Biology.
HENRY GIBBONS, JR., M.D., Professor of Obstetrics and Diseases of Women.
J. R. PREVOST, M.D., Professor of Materia Medica and Therapeutics.
WILLIAM A. DOUGLASS, M.D., Demonstrator of Anatomy.

The Regular Course of Lectures in this institution commences on the first Monday in June, and continues until November. A Preliminary, or Winter Course commences early in January of each year, and is free to all matriculants for the Regular Course. Ample clinical instruction is given at the Hospitals and the College throughout the year; and the Dissecting Room and the Laboratory are open the year round.

Further information may be obtained by applying in person, or by letter, to

HENRY GIBBONS. Jr., M.D., Dean of the Faculty,
No. 26 Montgomery street, San Francisco.

THE

CALIFORNIA TEACHER.

APRIL, 1874.

VOL. XI. SACRAMENTO. No. 10

[*For the California Teacher.*]

ON THE PHYSICAL GEOGRAPHY OF CALIFORNIA.

BY J. D. WHITNEY.

ARTICLE III—THE CORDILLERAS.

The mass of mountain ranges which we call "the Cordilleras of North America," or in preference simply "the Cordilleras," is perhaps the largest and most complicated system of chains on the earth's surface. There is nothing which can be compared with it in magnitude—taking into consideration area and number of subordinate ranges—unless it be the system of Central Asia, and how far this latter can properly be considered as a unit is not yet known and perhaps will not be for many years to come. The difficulties in the way of the exploration of Central Asia are so great, that it will be long before we have a clear idea of the relations to each other of the different chains which traverse that vast region.

As before stated, portions of the Cordilleras of North America have already been pretty carefully worked out, and enough is known of the system as a whole to justify the assertion that it cannot be divided into entirely independent portions; but that, on the contrary, it must be considered as one connected whole, with many subordinate, but never entirely isolated.

Geographical and geological peculiarities must both be taken into account in classifying mountain ranges; and this is especially the case in regard to the Cordilleras, for neither geography nor geology alone is sufficient to give the necessary light for that purpose. Here, in this attempt at a generalized description of the mountains west of the 105th meridian, we will first notice the most striking geographical features of the system, and then see how far geology—in the present state of our knowledge of the subject,—will help us in the task which we have undertaken.

Among the geographical facts to be considered, the most important are: extent and direction of the whole system, and then, extent, direction, and altitude of the subordinate parts.

The exterior lines limiting the mass of mountain ranges in question, may be roughly indicated as forming a lozenge-shaped figure, having two parallel north and south sides, and two which run in a northwest and southeast direction. The length of each side is approximately 600 miles, but the figure is not completely closed at the north and south extremities. The whole area thus embraced is not far from a million of square miles. The western edge of the figure corresponds in trend to the line of the Pacific Coast, which, as a glance at the map will show, has a northwest trend as far as Cape Mendocino and then bends to the east, acquiring a north and south direction, which it preserves as far as the limits of our territory, or to the vicinity of Vancouver Island. The north and south trending portion of the Pacific Coast edge of the Cordilleras is known as the Cascade Range; the northwest and southeast part, as the Sierra Nevada; and bordering on these ranges, still nearer the Ocean, are the Coast Ranges of Oregon and California, parallel with the Sierra and Cascade Range, and inosculating with them at the north and south extremities of the whole mass, and also at the point where the change in the trend takes place, near the boundary between the two States to which these ranges chiefly belong.

The Rocky Mountains proper, in Southern Wyoming and Colorado, with their continuations southward in New Mexico, form the north and south trending portion of the eastern rim of the Cordilleras, and in latitude 43°, nearly, the change from a northern to a northwestern direction of the ranges takes place;

the Big Horn, Wind River, Bitter Root and other subordinate chains, of which the system is here made up, having all the same northwesterly trend as the Sierra Nevada.

The result of the convergence of the ranges north and south is, that the whole mass of the Cordilleras, which covers a breadth of eighteen degrees of longitude in its central portion, or nearly in our latitude, has a breadth of only a little more than eight degrees at our northern limit,—the parallel of 49°; and, although the convergence is not so marked at the southern border of our territory, we find on going further south into Mexico that the system narrows gradually, but constantly, until the whole nearly disappears at the Isthmus of Panama.

These, then, are the defining limits of the Cordilleras—well marked on every side except the northeast, where the ranges are much broken, and, as yet, but little explored in detail; indeed, in that quarter, the names of the chains are uncertain, and in two or more instances several quite distinct ones are known by the same appellation.

This frame, as it may be called, encloses a high plateau, which through its centre, east and west, has an elevation of from 4,000 to 5,000 feet above the sea-level, and which falls off in height toward the north and south from that central line. This plateau has, built upon it, a great number of ranges of mountains, the waters finding their way down whose slopes are discharged into the Pacific chiefly by the Columbia and the Colorado, or else they lose themselves in the desert, and do not run to the sea at all, but evaporate and disappear. The drainage of the area in question is indeed most remarkable; but, before noticing this, we must first speak of the ranges which traverse it.

There is no one of these ranges which can fairly be considered the dominant one, but the Wahsatch comes nearest to occupying that position. This chain forms the eastern edge of the Great Basin proper, or the region without drainage to the ocean, and it extends with a nearly north and south course through six degrees of latitude, rising very precipitously from the plateau, as seen from the western side, to an elevation of from 4,000 to 6,000 feet above it. Right through the centre of the Wahsatch, passes the overland railroad, by means of one of those deep gorges which cut this range almost to its base, and without the aid of which it would have been almost impossible to get across

the Continent, except by an immense detour either to the north or the south.

Between the Wahsatch and the Rocky Mountains is the most elevated portion of the great Continental plateau, which embraces the series of the Parks, beginning with that called San Luis Park, and ending with the so-called Laramie Plains, which, with the South, Middle and North Parks, form a plateau traversed by spurs of the Rocky Mountains, and having an elevation of from 8,000 to 10,000 feet above the sea-level, the highest portion being in latitude 39°, along the northern edge of the South Park, from which there is a gentle decline in both directions. The great tertiary plains of Southwestern Wyoming belong to the same lofty plateau, and it is through these that the railroad passes, keeping always at an elevation about equal to, or even greater in places than, that of the summit of the Sierra on the line of the Central Pacific.

The only well defined range between the Wahsatch and the Rocky Mountains is the Uintah, and this is the only high and marked chain of mountains in the Cordilleras which has a distinct east and west trend. South of the Uintah is a region of tremendous cañons, rough and almost impassable, where the streams—branches of the Colorado—have worn down their beds in the soft horizontally stratified rocks in the most surprising manner, so that the roughest mountain region could hardly be more difficult to traverse.

Between the Wahsatch and the Sierra Nevada are a great number of parallel ranges, having a direction a little east of north and west of south, and which are generally long, narrow and precipitous. Their extent and direction may be easily made out from the Nevada map. These ranges rise from a base of 5,000 feet high, or thereabouts, and run from the Sierra Nevada obliquely across to the Humboldt River, which marks the limit of their extension towards the north. Beyond this we meet the southern edge of the stupendous volcanic plateau which covers so large a portion of Western Oregon and Washington Territory, as well as of Southwestern Idaho, Northern Nevada and Northeastern California. Towering high above the volcanic plateau is the mass of the Blue Mountain Range, which lies to the west of Snake River in Eastern Oregon, and which is perhaps less known than any other chain of mountains

within our limits. To the west of Snake River, and between that and the Bitter Root Range, are groups of broken ranges which have hardly yet received names and which are quite unexplored, although they have from time to time been the scene of more or less successful gold mining.

The drainage of the region enclosed between the Rocky Mountains and the Sierras is very remarkable. Owing to the great elevation of the central portion of the plateau, the streams rising on the west slope of the ranges which crown the eastern edge of the region in question, have to find their way to the sea by means of long detours to the north and south. The sources of these streams are in the Wind River Range, where the Colorado, the Columbia and the Missouri head. In the higher portion of the vast triangular area embraced between the two great rivers which drain the western slopes of the Rocky Mountains lies the Great Basin, which includes almost the whole of Nevada, as well as the western part of Utah.

The principal portion of the drainage of the Sierra Nevada and Cascade Range is conveyed into the ocean by means of two large streams, which run parallel with those ranges and between them and the Coast Mountains, and which find their way out to the sea through gaps or breaks in those mountains, making altogether a system of drainage as unlike that believed to exist in the days of Humboldt as can well be imagined. Not only are the Coast Ranges broken through by streams that drain the Sierra Nevada; but even the Cascade Range itself is cut to its very base to give passage to the Columbia, almost under the shadow of those magnificent volcanic cones Mount Hood and Mount St. Helen.

Want of navigability is a characteristic of all the streams which drain the Cordilleras to the west. Instead of the vast stretches opened to steam navigation by the Mississippi and all its tributaries, allowing access to points two and three thousand miles away from its mouth, we have the Colorado, which is of hardly any account at all for the purpose of commerce; the Columbia, with two portages by railroad before the Cascade Range is crossed; the Sacramento, navigable for moderate sized steamboats for sixty miles only; and, with these exceptions, no other navigable streams along our whole Pacific Coast; while, it

may be added, there is not a single navigable river on the whole Pacific Coast of South America.

Of the streams within the Great Basin, the only one having any considerable development is the Humboldt, which marks the only convenient line for travel across the Basin and the only practicable railroad route. As before mentioned, it also marks an important change in the geological structure of the region.

The number of waterfalls within the area of the Cordilleras is very great, although but few if any have attained celebrity. The most interesting are those of Snake River, called the Shoshone Falls, and these are but little inferior to Niagara in grandeur, all the features of the surrounding scenery being, in each case, taken into consideration. Situated in the midst of the volcanic region, with stupendous overhanging cliffs of basaltic lava, the Shoshone Falls are among the finest in the world, and are surpassed probably, only by Niagara, the Kaieteur and the Falls of the Zambesi. The number of beautiful falls on the upper waters of the Columbia yet unknown and nameless is no doubt considerable, and the scenery of that portion of the country is of a character which is indeed wonderful in its grandeur of simplicity and desolation.

[*For the California Teacher*]

THE VALLEY OF HUMILIATION.

There seems to be a disposition, at present, to find fault, not so much with the work of the teacher, as with the worker; their labor is over at 3 o'clock,—in the eye of the law, at least, —and their compensation is fair; therefore, say the Argus-eyed, we must watch them closely, be sure that this salary is not earned too easily, and magnify every flaw which we may find, in order to keep before them a due sense of their own unworthiness.

But the most obtuse of mortals will admit that there are, among the roses which they fancy bestrew the teacher's path, a few sharp thorns.

How soon a pretty round-cheeked girl begins to lose her bloom, and grow care-worn and "school-teacher-looking," we all must have noticed; the *work* of teaching is the smallest part;

it is the *worry* that wears away her youth. The anxiety lest she be called a failure; the necessity of keeping quiet sixty little bodies which cannot keep still, and ought not to keep still; the fear lest they be not learning as rapidly as they ought; the kind, or alas! unkind criticisms of those about her; the falsehoods, the whippings, the truant-playing, the parents;—only those who have passed through it can fully understand, and know how it is that the stifling air of the school-room makes the roses fade.

The present Board of Education has, doubtless, only the public weal in view; under the most careful and conscientious administrations, abuses will creep in or spring up which need a "new broom;" only the inefficient and lazy desire a lax discipline in the Department; and faithful teachers know that their worth is better appreciated when mediocrity is condemned.

Yet it is not wholly in fun, nor wholly without reason that the administration of the present Board has been termed the "Reign of Terror;" the sword of Damocles is not a cheerful thing to see suspended over one's head, and those who have served the Public faithfully and earnestly for years, who have given the best of life, *youth*, to their work, may well feel that they pass through the "Valley of Humiliation" when they receive a coldly worded reprimand from those in power, for some real or fancied short-coming and realize at the same time how insecure is the tenure of their positions.

The notifications which some teachers received that their classes were not in a satisfactory condition, were based, undoubtedly, upon the reports made by Principals during the latter part of December.

It is maintained, not by the interested ones alone, but by all who love to see justice done, that these reports were most insufficient data to base notices upon, which could not fail to awaken in the minds of all who received them, a keen sense of pain and humiliation.

It presupposed that Principals were all, without exception, actuated by a pure sense of justice, and that their judgments were infallible.

There are about fifty Principals in the city, and few will dare assert that among so many human beings not one will be found who will allow malice, prejudice or favoritism to sway their

minds, if not consciously, then unconsciously. Many teachers declare, that there is not one school in the city, from the High Schools down to the lowest Primary, in which the evil of favoritism does not prevail to a greater or less degree.

Some are born to win hearts, and so long as those in power are human, the charming and agreeable will have their faults gently covered and their failures excused, to the bitter envy and wrong of the less fortunate.

But though a Principal were more than humanly cold and conscientious, so that no grain of favor toward one, or prejudice toward another should creep into the report, I protest against their judgment being the "It is so," from which there is no appeal.

The opinion might be hazarded that in four cases out of five the Assistants on the first floor are better judges of a teacher's success than the Principal, even when the latter has every desire to see clearly and form a correct judgment; and this without going out of their way in the least, or neglecting their own affairs; in looking down or looking up, things may be distorted, but on her own plane a teacher is certain to be set down at her true value; some Principals object, I have understood, to teachers thus passing judgment on each other, but it will be done until free speech is forbidden, and eyes and ears abolished.

To their credit be it recorded, that the powers that be are so rarely enlightened, however warmly the inefficient may be praised and rewarded.

The very presence of the Principal in the room imposes a restraint upon the pupils; especially if the teacher has impressed upon their minds the necessity of behaving particularly well during such visits; by no means an unusual precaution. I heard of one class, in which the discipline was esteemed "fair," the pupils of which had picnics in the aisles every forenoon, by spreading down their shawls, and eating their lunches thereon, the teacher has since been rewarded with one of the best positions in the gift of the Department; and the faithful plodder who then drudged away in the next room, recently received a notice from the Classification Committee that her class was "not in a satisfactory condition;" and she now trembles between anger at the injustice, and terror of losing the place which gives her bread and butter.

But even if these reports were just in every particular, so far as those giving them were able to make them just, there are other reasons why they should not have been made the sole basis of these mortifying reprimands, especially in the cases of those who have long been teachers in the Department.

In some schools, more than half, in others, *not one* of the assistants received notices; yet the average of good and poor must be about the same in all.

Here a palpable injustice is done; what one calls "Good" another rates "Fair," and another "Poor;" so that it happens that in one school a teacher receives a notice, who is, perhaps, twenty-five per cent. more efficient than another, in another school, who receives none.

However severe the requirements, though they tax the very last grain of strength; however heavily the hand of power may press, we can become used to it, and still bear a little more; it is the single grain of injustice which *cannot* be borne.

Just after the recent election, a remark was current in educational circles, said to have been made by one of the newly-elected officials, to the effect that "teachers *had* had an easy time, but *now* they had got to work."

Whether this was true or not, the remark of the gentleman to whom it was credited does not very much matter, since the whole tenor of the acts of the new Board has borne out the spirit of the remark with suspicious exactitude.

Among as many men and women as those employed by the Department, there will always be found a certain proportion who will manage in some way to shirk their duties, and get along with as little labor as is consistent with a bare existence in the school-room; and no severity, no rule-making, no ingenuity, will ever succeed in making these teachers do *just* as they ought; they *intend* to take life easy, and they will, and they *do*.

But all the new rules and ingenious contrivances for extorting additional work, fall upon those who already were working too hard; having exhausted all natural strength, they are compelled to do that ruinous thing,—work with the nerves.

It is surely a melancholy thought, enough to make Directors and Superintendents pause and think for a moment, that young women should lead such a life, that each Friday night brings a

profound feeling of relief—"another week gone!" I fancy slaves lead a similar existence.

I once heard a teacher say,—one would not have suspected her of working too hard, either,—"I *live* in Saturdays, Sundays and vacations; the rest of the time I feel like a clock, wound up, and always going with a whirr."

The recent consolidations may save the Department money; it is to be hoped that they will, since the work cannot, by any possibility, be done as well.

We might, perhaps, *teach* sixty pupils in the same time, and with as good results as we teach forty, although it is much to be doubted; but the *discipline* of the additional third takes a great deal of time, patience, and—well, resignation; vastly more than Directors imagine.

The teachers are a small, uninfluential, and uncomplaining body of human beings; but I venture to say, that among the salaried servants of the Public, none do their work more faithfully, earnestly and quietly; they certainly have a right to the courtesy and justice of a hearing in their own defense, before they are reprimanded and condemned. In the treason laws of England, *two* credible witnesses must be confronted with the offender; an item which we beg to recommend to the notice of the Board. Meanwhile, in view of the general uncertainty of things, we will adopt the wise man's prayer, "Help us to remember that our common mercies are uncommon blessings."

C. G. D.

[*For the California Teacher.*]

ON THE USE OF RULES IN THE STUDY OF LANGUAGE.

It is a general custom among teachers to require their pupils to depend on rules, and insist on enforcing them, in the study of language, and to regard them as indispensable auxiliaries in their labors.

Some recent experiments and careful observations have confirmed what I have long suspected to be true, namely, that rules, as they are regarded and employed, hinder, instead of aiding the learner.

In order to make this statement plain, it is necessary to take into consideration the law of mental development. It is clearly recognized that repetition of any two psychical states in immediate succession, is the basis of all mental action. All psychical action must depend on nervous structure, and may be interpreted in terms of nerve action, corresponding under all circumstances with its varying states. Herbert Spencer has shown "that when a wave of molecular transformation passes through nervous structure, there is wrought in the structure a modification such that, other things equal, a subsequent like wave passes this structure with *greater facility* than its predecessor." As there can be no mental action without a corresponding nervous structure, and as this is due to particular nerve action along certain nerve fibers and their ganglia, mental manifestation must be determinate, as the nervous structure along which it passes is determinate, that is to say, every nerve fiber and vesicle performs a certain function, and can perform no other. The power to distinguish red from blue is due to a particular nerve structure, having its vesicles in the central ganglia and cortical substance of the brain, and its fibers in the intervening medullary mass. In a person born blind, probably no such particular nerve tissue exists. Thus mental actions are disposed to run in definite channels which are established by psychical agency, and the more frequent the repetition of any two psychical states in immediate succession, the more readily, easily and accurately they are performed, and the more coherent they become, until they pass into involuntary unconscious,—that is automatic—action.

Inasmuch as language consists of signs, representing certain states of consciousness, and as the relation between signs and things signified is direct and complete, and as the simpler the relation between any two psychical states the more readily and easily they cohere and become automatic, in making an application of this law to the acquisition of language, we discover that any complication is inadmissible. A rule is not a *form* of language, involved in the action here stated, but an *abstraction*, requiring a more complicated mental process to understand, and a still more complicated mental process to apply; and its interposition can but disturb the simpler coherence of signs and things signified, as they exist in their determinate forms. Lan-

guage is only the symbols of phenomena, or more specifically, the symbols of objects, phenomena and subjective states, and must be automatic to carry out the purposes for which it is established. There are no corollaries deducible from it, in a logical sense,—in other words it is entirely artificial, arbitrary conventional, established by common consent, and depends for its perpetuity on common usage. Now its mode of acquisition involves the law of simple relations; that is, the coherence of signs and things signified in their determinate forms; and this process is empirical, consisting of repetition until automatic coherence is fixed; forms presented to the eye, forms presented to the ear, made interchangeable by repetition of the one in terms of the other—these are symbols; objects, phenomena and subjective states are things symbolized. To interpret things symbolized into their symbols is the peculiar and exclusive use or office of language, and the ability to do this, other things equal, depends on the frequency and persistency of repetition.

Thus we deal wholly with forms, determinate in their character, and simple in their relations; rules are not forms, but products of higher and more complicated factors, and cannot apply to the simpler processes which tend to make coherent symbols and things symbolized. I have found that pupils in the lower divisions of the third grade, where no rules for spelling are ever employed, will spell ninety per cent. of words coming under the rule for monosyllables doubling the final "f," "t," and "s," and in more advanced grades, grammatical inflections are equally as well understood, before the pupils have studied grammar. In answer to the question, "Why do you put two 'p's' in the word 'stepped,' when 'step' has but one, and the suffix added has none?" the answer was, "It is always spelled so." No other reason can be given. I asked a boy in the third grade to spell the plural of "life;" after spelling it correctly, upon further inquiry it was ascertained that he knew nothing of the rule for changing "f" to "v" in certain words ending in "f" or "fe." Here was accomplished at an early age, without the knowledge of a rule, what often fails when rules are depended on. I have known scholars able to repeat all the rules given for elocutionary exercises, and violate every one of them in reading; and I have known children, ignorant of the alphabet, show by their language that they were perfect in inflection, emphasis

and modulation, who will probably be spoiled in their reading in after years, by attempting to read by rule. I have seen scholars in the first grade, in writing ten rules for the use of capitals, *violate every one of them.* I have seen persons who could repeat every rule in Brown's Grammar, make an indiscriminate slaughter of them both in talking and writing. I have seen others, who never saw or heard of them, observe them strictly in their use of language. Interpreted by the law here set forth, the seeming discrepancy is easily explained. *We do not learn language by rule.* It is well for all those who study language, to express in general terms the forms of speech and modes of utterance, as a measure of their knowledge of language, but to study those written by others, and depend on them, is worse than time and labor thrown away. Each individual is surrounded by circumstances more or less special; and the peculiar forms of speech and modes of utterance that each one has, correspond with the forms and modes to which he has been most accustomed. This explains the various provincialisms and dialects peculiar to different sections of country; it explains the difference of all languages. *The mode of speech displayed by each individual will be that which occurs the oftenest within the range of his experience.*

The art of acquiring language consists in associating signs with things signified, and so combining them, that when one is present in consciousness the other immediately follows without conscious effort, and may be stated in general terms, thus: When any two psychical states occur in immediate succession, an effect is produced, such that if either subsequently recurs, the other is brought into consciousness, and if the recurrence is sufficiently frequent and persistent the action becomes automatic.

The method of teaching language, then, is clearly indicated. It is simply *repetition* in all forms that the ingenuity of the teacher can suggest and employ; forms presented to the eye—silent reading and writing, copying and composition; forms presented to the ear—oral spelling, pronunciation and declamation; forms combined—reading aloud and dictation. In a former paper, mention was made of vivid and faint manifestations; the *acquisition* of language deals with the vivid manifestations, that is, those mental states that are brought into activity by the eye

and ear; but the *use* of language involves the faint, as well as the vivid manifestations.

The forms in text-books should be such as are found elsewhere in common use; the practice of separating the syllables in books for beginners should be condemned, as it interferes with the acquisition of sight-forms. The teacher should be vigilant and untiring in his efforts to have every exercise correct, in every particular, such as capitals, punctuation, orthoepy, grammatical inflections and agreement, and his pupils will advance accordingly.

DEPARTMENT OF PUBLIC INSTRUCTION.

AMENDMENTS TO THE SCHOOL LAW.

[In order to place the Amendments to the School Law, before our readers at the earliest practical moment, we have deferred the issuing of the April number of the TEACHER till the close of the session of the Legislature. Our comments upon these amendments must be deferred till next month. A revised edition of the School Law will be issued as soon as the statutes of 1873–74, are published, which will not be perhaps, before July, 1874.]

1521. The powers and duties of the Board are as follows:

First—To adopt rules and regulations, not inconsistent with he laws of this State, for its own government and for the government of the public schools and district schools libraries;

Second—To prescribe and enforce rules for the examination of teachers;

Third—To prescribe a standard of proficiency before a County Board of Examination, which will entitle a person examined by such Board to a State certificate;

Fourth—To prescribe and enforce the course of study in the public schools;

Fifth—To prescribe and enforce the use of a uniform series of text books in the public schools, excepting in the City and County of San Francisco;

Sixth—To adopt a list of books for district school libraries.

Seventh—To grant life diplomas;

Eight—To review on appeal, an order revoking a State certificate or diploma;

Ninth—To have done by the State Printer or other officers having the management of the State Printing, any printing required by it;

Tenth—To adopt and use in the anthentication of its Acts, an official seal;

Eleventh—To keep a record of its proceedings;

1532. It is the duty of the Superintendent of Public Instruction:

First—To superintend the public schools in this State;

Second—To report to the Governor, on or before the fifteenth of November, of the years on which the regular sessions of the Legislature are held, a statement of the condition of the State Normal School and other educational institutions supported by the State, and of the public schools;

Third—To accompany his report with tabular statements, showing the number of school children in the State; the number attending public schools, and the average attendance; the number attending private schools, and the number not attending schools; the amount of State School Fund apportioned, and sources from which derived; the amount raised by county and district taxes, or from other sources of revenue, for school purposes; and the amount expended for salaries of teachers, and for building school houses;

Fourth—To apportion the State School Funds, and furnish the Controller, State Board of Examiners, and each County Treasurer and County Superintendent, with an abstract of such apportionment;

Fifth—To draw his order on the Controller in favor of each County Treasurer, for the school moneys apportioned to the county;

Sixth—To prepare, have printed, and furnish to all officers charged with the administration of the laws relating to public schools, and to teachers, such blank forms and books as may be necessary to the discharge of their duties;

Seventh—To have the law relating to public schools printed in a pamphlet form, and annex thereto forms for making reports and conducting school business, the course of study, rules and regulations, a list of text books and library books, and such suggestions on school architecture as he may deem useful;

Eighth—To supply school officers and teachers, school libraries, and State libraries with one copy each of the pamphlet mentioned in the preceding subdivisions;

Ninth—To visit the several orphan asylums to which State

appropriations are made, and examine into the course of instruction therein;

Tenth—To visit the schools in the different counties, and inquire into their condition; and the actual traveling expenses thus incurred, provided they do not exceed fifteen hundred dollars per annum, shall be allowed, audited, and paid out of the General Fund in the same manner as other claims are audited and paid;

Eleventh—To authenticate, with his official seal, all drafts, or orders drawn on him, and all papers and writings issued from his office;

Twelfth—To have bound, at an annual expense of not more than one hundred and fifty dollars, all valuable school reports, journals, and documents, in his office, or hereafter received by him, payable out of the State School Fund;

Thirteenth—To deliver over, at the expiration of his term of office, on demand, to his successor, all property, books, documents, maps, records, reports, and other papers belonging to his office, or which may have been received by him for the use of his office.

[New Section.]

1533. Superintendent of Public Instruction must report to the Controller, on or before the tenth day of August, of each year, the total number of children in the State between the ages of five and seventeen years, as shown by the latest reports of the School Superintendents on file in his office.

1543. It is the duty of the County Superintendent,

1. To apportion the school moneys of each school district quarterly;

2. On the order of the Board of Trustees, or Board of Education, to draw his warrant upon the County Treasurer against the School Fund of any city, town, or district; he must draw his warrants in the order in which they are ordered by the proper authority; each warrant must specify the purpose for which the money is required, and must be paid in the order in which it is drawn, but no warrant must be drawn unless there is sufficient money in the Fund to pay it;

3. To keep open to the inspection of the public a register of warrants, showing the Fund upon which the warrants have been drawn, the number thereof, in whose favor, and for what

service drawn, and also a receipt from the person to whom the warrant was delivered;

4. To visit each school in his county at least twice in each year; and for every school not visited the Board of Supervisors must on proof thereof, deduct ten dollars from the County Superintendent's salary;

5. To preside over Teachers' Institutes held in his county, and to secure the attendence thereat of lecturers competent to instruct in the art of teaching, to enforce the course of study, the use of the text books, and the rules and regulations for the examination of teachers prescribed by the proper authority;

6. To issue temporary certificates, valid until the next regular meeting of the County Board of Examination, to persons holding certificates of like grade granted in other counties;

7. To certify to the State Board of Examination the names of persons examined before County Boards of Examination;

8. To distribute all laws, reports, circulars, instructions, and blanks, which he may receive for the use of school officers;

9. To keep in his office the reports of the Superintendent of Public Instruction and a file of the educational journal;

10. To keep a record of his official acts, and of the proceedings of the County Board of Examination, including a record of the standing in each study of all applicants examined;

11. To keep in his office such works on school architecture and education as may be prescribed by the State Board of Education, and pay for them out of the unapportioned County School Fund;

12. To (except in incorporated cities and towns) pass upon, and approve, and reject plans for school houses;

13. To appoint Trustees to fill all vacancies created by failure to elect, or otherwise, to hold till the next annual election;

14. To make reports when directed by the Superintendent of Public Instruction, showing such matters relating to the public schools in his county as may be required of him;

15. In all counties containing twenty thousand inhabitants or upwards, to devote his whole time to the supervision of the schools in his county;

16. To carefully preserve all reports of school officers and teachers, and, at the close of his official term, deliver to his successor all records, books, documents, and papers, belonging to

the office, taking a receipt for the same, which shall be filed in the office of the County Clerk.

1544. If he fails to make a full and correct report, as required under the provisions of subdivision fourteen of section fifteen hundred and forty-three, at the time fixed by the Superintendent of Public Instruction, he forfeits one hundred dollars of his salary, and the Board of Supervisors, upon receiving from the Superintendent of Public Instruction notice of such failure, must deduct the amount forfeited from his salary.

1548. He must draw his warrant on the unapportioned County School Fund for the payment of members of the County Board of Examination, and in his own favor for the binding of school documents, not to exceed twenty dollars a year; for postage and expressage for his office, not to exceed one dollar for each district in his county, and for any other incidental expense as may be authorized by law.

1549. Each County Superintendent may appoint a Deputy, but no salary payable out of the School Fund must be allowed such Deputy.

[New Section.]

1551. Each School Superintendent in this State, must on or before the first day of August in each year, report to the Superintendent of Public Instruction and to the Board of Supervisors of their respective counties, the number of children in their counties between the ages of five and seventeen years, as appears by the latest returns of the Census Marshal on file in his office.

It shall be the duty of every County Superintendent to inquire and ascertain whether the boundaries of the school districts in his county are definitely and plainly described in the records of the Board of Supervisors, and to keep in his office a full and correct transcript of such boundaries. In case the boundaries of districts are conflicting or incorrectly described, he shall change, harmonize, and describe them, and make a report of such action to the Supervisors, and, on being ratified by the Supervisors, the boundaries and descriptions so made shall be the legal boundaries and descriptions of the districts of that county. For searching and transcribing such records and equalizing district boundaries, he may be allowed five dollars per day for each day's labor, to be paid out of the County School Fund. The

County Superintendent, if he deem it necessary for the guidance of School Census Marshals, may order the description of the district boundaries to be printed in pamphlet form, and pay for the same out of the County School Fund.

[New Section.]

1552. Each County Superintendent, except when otherwise provided by statute, shall receive such salary and his reasonable traveling expenses, to be estimated by the Board of Supervisors, and as may be allowed by the Board of Supervisors, which shall be paid out of the County General Fund, in the same manner as other salaried county officers are paid; *provided*, that such compensation shall not be less than a sum equal to twenty dollars for each school district in his county, exclusive of traveling expenses, and that he shall be allowed, in addition to his salary, a sum for postage and expressage, payable out of the County School Fund, equal to one dollar for each school district; *provided*, that in incorporated cities, each school containing three hundred pupils shall be considered equal to one school district.

No School Superintendent who receives a salary of fifteen hundred dollars or more per annum, must follow the profession of teaching or any other avocation that can conflict with his duties as Superintendent.

1560. Whenever the number of school districts in any county is twenty or more, the County Superintendent must hold at least one Teachers' Institute in each year; and every teacher employed in a public school in the county must attend such Institute and participate in its proceedings.

1561. In any county in which there are less than twenty schools districts, the County Superintendent may, in his discretion, hold an Institute.

1564. The County Superintendent must keep an accurate account of the actual expenses of said Institute, with vouchers for the same, and draw his warrant on the unapportioned County School Fund to pay said amount; *provided*, that such amount must not exceed one hundred dollars for any one year.

1577. No new district can be formed unless the parents or guardians of at least fifteen census children, resident of such proposed new district, present a petition to the County Superintendent, setting forth the boundaries of the new district asked

for. The boundaries of any district cannot be changed, unless at least ten heads of families residing at a greater distance than two miles from any district school house present a petition to the County Superintendent, setting forth the change of boundaries desired, and the reasons for the same.

1578. After giving due notice to all parties interested, by posting notices in three public places in the district, one of which shall be at the door of the school house, for at least one week, the County Superintendent must transmit the petition to the Board of Supervisors, with his approval or disapproval. If he approves the petition, he may note such changes in the boundaries as he may think desirable.

1579. The Board of Supervisors must, at their first meeting after the receipt of the petition, act upon the same. If the Board establishes the district, they may do so in accordance with the original prayer of the petition, or with such modifications as they choose to make.

1593. An election for School Trustees must be held in each district on the last Saturday of June of each year, at the district school house, if there is one, and if there is none, at a place to be designated by the Board of Trustees. The Board of Trustees must consist of three members, hold office for three years, except when elected to fill a vacancy, and must be so arranged that one trustee shall be elected each year.

1595. Not less than ten days before the election required under section fifteen hundred and ninety-three, the Trustees must post notices in three public places in the district, which notices must specify the time and place of election, and the hours during which the polls will be kept open; if within five days of the election the Trustees have failed to post the notices required under this section, then any three electors of the district may give notice of such election.

1599. The voting must be by ballot; *provided*, that the provisions of sections eleven hundred and eighty-seven and eleven hundred and ninety-one of the Political Code may be dispensed with.

1600. Any person offering to vote may be challenged by any elector of the district, and the Judges of Election must thereupon administer to the person challenged an oath, in substance as follows: "You do swear that you are a citizen of the United

States, that you are twenty-one years of age, that you have resided in this State six months next preceding this election, and in this school district thirty days, and that you have not before voted this day." If he takes the oath prescribed in this section, his vote must be received, otherwise his vote must be rejected.

1602. The officers of election must, after counting the votes, make and deliver certificates of election to the persons elected, a copy of which, with the oath of office attached, must be forwarded to the County Superintendent.

[New Section.]

1611. Except when otherwise authorized by special statute, every school district shall be under the control of a Board of School Trustees, consisting of three members.

[New Section.]

1612. In school districts newly organized, or in case of vacancies, for any cause, in an old one, three School Trustees must be elected, to hold office for one, two, and three years, respectively, from the first Saturday in July next succeeding their election.

1617. The powers of Boards of Trustees of school districts and of Boards of Education in cities, are as follows:

First—To prescribe and enforce rules not inconsistent with law, or those prescribed by the State Board of Education, for their own government and the government of schools;

Second—To manage and control the school property within their districts;

Third—To purchase school furniture and apparatus, and such other things as may be necessary for the use of schools.

Fourth—To rent, furnish, repair, and insure the school property of their respective districts;

Fifth—When directed by a vote of their district to build school houses, or to purchase or sell school lots;

Sixth—To make, in the name of the district, conveyances of all property belonging to the district and sold by them;

Seventh—To employ the teachers, janitors, and employees of schools; to fix and order paid their compensation;

Eighth—To suspend or expel pupils for misconduct;

Ninth—To exclude from schools children under six years of age;

Tenth—To enforce in schools the course of study and the use of the text books prescribed and adopted by the State Board of Education;

Eleventh—To appoint District Librarians, and enforce the rules prescribed for the government of district libraries;

Twelfth—To exclude from schools and school libraries all books, publications or papers of a sectarian, partisan or denominational character;

Thirteenth—To furnish books for the children of parents unable to furnish them;

Fourteenth—To keep a register, open to the inspection of the public, of all children applying for and entitled to be admitted in the schools, and to notify the parent or guardian of such children when vacancies occur, and receive such children in the schools in the order in which they are registered;

Fifteenth—To make arrangements with the Trustees of any adjoining district for the attendance of such children in the school of either district as may be best accommodated therein, and to transfer the school moneys due by apportionment to such children, to the district in which they may attend school.

Sixteenth—On or before the first day of June, in each year, to appoint a School Census Marshal, and notify the School Superintendent thereof;

Seventeenth—To make an annual report, on or before the first day of July, to the School Superintendent, in the manner and form and on the blanks prescribed by the Superintendent;

Eighteenth—To make a report, whenever required, directly to the Superintendent, of the text books used in their schools;

Nineteenth—To visit every school in their district, at least once in each term and examine carefully into its management, condition and wants; this clause to apply to each and every member of the Board of Trustees.

1620. Writing and drawing paper, pens, ink, and lead and slate pencils, for the use of the schools, must be furnished under the direction of the Boards of Education and Trustees, and charges therefor must be audited and paid as other claims against the School Fund of their districts are audited and paid.

1621. The Board of Trustees and Board of Education must use the school moneys received from the State or county apportionments, exclusively for the support of schools for that school

year, until at least an eight months school shall have been maintained; if at the end of any year there is an unexpended balance, it may be used for the payment of claims against the district outstanding, or it may be used for the year succeeding.

1623. Boards of Trustees are liable as such, in the name of the district, for any judgment against the district for salary due any teacher on contract, and for all debts contracted under the provisions of this Chapter, and they must pay such judgment or liabilities out of the school moneys to the credit of such district; *provided*, that the contracts mentioned in this section are not in excess of the school moneys accruing to the district for the school year for which the contracts are made, otherwise the district shall not be held liable.

1634. It is the duty of the Census Marshal:

1. To annually, in the month of June, take a census of all the children in his district under seventeen years of age;

2. To report the result of his labors to the County Superintendent (or to the Board of Education, in cities,) before the first day of July, in each year;

3. He shall visit each habitation, house, residence, domicil, or other place of abode, in his district, and by actual observation and interrogation, enumerate the census children of the same.

1635. Whenever a district is formed, lying partly in two adjoining counties, the Census Marshal must report to each County Superintendent the number of children in each county.

1636. His report must be made under oath, upon blanks furnished by the Superintendent of Public Instruction, and must show:

1. The number, age, sex, color, and nationality of the children listed;

2. The names of the parents of such children;

3. Such other facts as the Superintendent of Public Instruction may designate.

1638. He must not include in his report children who are attending institutions of learning, or such benevolent institutions as deaf and dumb, blind and orphan asylums, in his district, but whose parents or guardian do not reside therein.

1640. If the Census Marshal neglect or refuse to make his report at the time and in the manner herein required, and to perform any other duty devolved upon him, he must be deemed

guilty of a misdemeanor, and on conviction, be punished by fine or imprisonment.

1663. All schools, unless otherwise provided by special statute, must be divided into first, second and third grade. Each County Superintendent must, under instructions from the State Board of Education, determine the respective grade or class of schools in his county.

1665. Instruction must be given in the following branches: in the several grades in which each may be required, viz: reading, writing, orthography, arithmetic, geography, grammar, history of the United States, physiology, natural philosophy, natural history, elements of form, vocal music, and industrial drawing.

1666. Any pupil who cuts, defaces or otherwise injures any school house, fences or outbuildings thereof, is liable to suspension or expulsion; and on the complaint of the teacher or trustees, the parents or guardian of such pupils shall be liable for all damages.

1669. The education of children of African descent, and Indian children, must be provided for in separate schools; *provided*, that if the Directors or Trustees fail to provide such separate schools, then such children must be admitted into the schools for white children.

1696. Every teacher in the public schools must:

1. Before assuming charge of a school, file his certificate with the County Superintendent;

2. On taking charge of a school, or on closing a term of school, immediately notify the County Superintendent of such fact;

3. Enforce the course of study, the use of text books, and the rules and regulations prescribed for schools;

4. Hold pupils to strict account for disorderly conduct on the way to and from school, on the playgrounds, or during recess; suspend for good cause any pupil in the school, and report such suspension to the Board of Trustees or Education for review. If such action is not sustained by them, the teacher may appeal to the County Superintendent, whose decision shall be final;

5. Keep a State school register;

6. Make an annual report to the County Superintendent at

the time, and in the manner, and on the blanks prescribed by the Superintendent of Public Instruction. Any school teacher who shall end any school term before the close of the school year, shall make a report to the County Superintendent immediately after the close of such term; and any teacher who may be teaching any school at the end of the school year, shall, in his or her annual report, include all statistics for the entire school year, notwithstanding any previous report for a part of the year;

7. Make such other reports as may be required by the Superintendent of Public Instruction, County Superintendent, or Board of Trustees or Education.

1700. No warrant must be drawn in favor of any teacher, unless the officer whose duty it is to draw such warrant is satisfied that the teacher has faithfully performed all the duties prescribed in section sixteen hundred and ninety-six.

1701. No warrant must be drawn in favor of any teacher, unless such teacher is the holder of a proper certificate, in force for the full time for which the warrant is drawn, nor unless he was employed by the Board of Trustees or Education; *provided*, that nothing in this section shall interfere with any special school laws now in existence for the Counties of Trinity, Shasta or Inyo.

[New Section.]

1702. It shall be the duty of all teachers to endeavor to impress on the minds of the pupils the principles of morality, truth, justice and patriotism; to teach them to avoid idleness, profanity, and falsehood, and to instruct them in the principles of a free government, and to train them up to a true comprehension of the rights, duties, and dignity of American citizenship.

1712. The Boards of Trustees and of Education must expend the Library Fund, together with such moneys as may be added thereto by donation, in the purchase of school apparatus and books for a school library.

[New Section.]

1717. The Trustees shall be held accountable for the proper care and preservation of the library, and shall have power to assess and collect all fines, penalties, and fees of membership, and to make all needful rules and regulations not provided for

by the State Board of Education, and not inconsistent therewith, and they shall report annually to the County Superintendent, all library statistics which may be required by the blanks furnished for the purpose by the Superintendent of Public Instruction.

1742. The Board has power to grant:

1. Recommendations for life diplomas;
2. State educational diplomas, valid for six years;
3. State certificates of the first grade, valid for four years;
4. State certificates of the second grade, valid for three years;
5. State certificates of the third grade, valid for two years, to be granted only to females;
6. To review on appeal an order revoking a county or city certificate.

1746. State educational diplomas must be issued to such persons only as have been employed in teaching for five years, and who have held a first-grade State certificate for at least a year.

1747. Applicants for life diplomas must file with the State Board of Examination certificates of their success in teaching; and the Board, after examination, must present the application to the State Board of Education, with its recommendation.

1748. Every applicant for a State certificate shall be examined by written and oral questions in algebra, arithmetic, grammar, composition, geography, history of the United States, Constitution of the United States and California, physiology, natural philosophy, natural history, orthography, defining, penmanship, reading, method of teaching, vocal music, drawing, and School Law of California.

1749. The standing in each study must be indorsed upon the educational diploma or certificate, or otherwise it is not a valid certificate.

1750. Normal School diplomas, from any State Normal School in the United States, and life diplomas, by the State Board of Examination or Education in any of the United States, must be recognized by this State as primary evidence of fitness for teaching; and the Board may, on application of the holders thereof, issue, without examination, State certificates, and fix the grade thereof.

1751. The Board may grant State certificates to those who,

in examinations before County Boards, have attained the standard of proficiency prescribed by the State Board of Education; *provided*, that the original examination papers be forwarded to the State Board of Examination within fifteen days after the close of the examination.

1752. The Board may, for immoral or unprofessional conduct, profanity, intemperance, or evident unfitness for teaching, revoke any educational diploma or certificate granted by it.

1753. The Board may, at the expiration of the time for which they are granted, renew diplomas or certificates, except of the third grade, for a like period for which they were originally granted.

1770. The County Board must meet and hold examinations as follows: Commencing on the first Wednesday in the months of December, March, June, and September. The place of meeting must be designated by the Chairman.

1772. Certificates must be granted to those only who have passed a satisfactory examination in all the studies required for a State certificate of corresponding grade, and upon the questions prepared by the State Board of Examination, and reached the percentage prescribed by the State Board of Education.

1773. All examinations must be conducted partly in writing and in part orally.

1775. The Board may, without examination, renew certificates, and may revoke any county certificate for immoral or unprofessional conduct, profanity, intemperance, or evident unfitness for teaching.

1777. Members must each receive for their services a sum not exceeding three dollars per day, in addition to actual traveling expenses, for each quarterly session of the Board, payable out of the unapportioned County School Fund, on the warrant of the County Superintendent.

1790. The Board must meet and hold examinations as follows: Commencing on the first Wednesday in the months of December, March, June, and September. The place of meeting must be designated by the Chairman.

1791. The Board has power to grant:

1. Certificates of the same grade and for the same time as the State Board of Examination has power to grant;

2. High school certificates, valid for six years;

3. Special certificates of the first grade, valid for four years, upon such special studies as may be authorized by the State Board of Education or Board of Education in any city, or city and county;

4. High school and special certificates must be granted upon such examinations as may be authorized by the State Board of Education, or Board of Education of any city, or city and county. All other certificates must be granted upon examinations in all the studies required for a State certificate of corresponding grade, and upon questions prepared by the State Board of Examination, and upon the percentage prescribed by the State Board of Education.

1792. The Board may, without examination, grant certificates of like grade to holders of certificates granted in other cities, and renew all certificates, except of the third grade, granted by it, and revoke any certificate for immoral or unprofessional conduct, profanity, intemperance, or evident unfitness for teaching.

[New Section.]

1817. The County Superintendent in each county must, on or before the first regular meeting of the Board of Supervisors, in September in each year, furnish the Board of Supervisors and the Auditor, respectively, an estimate in writing of the minimum amount of County School Fund needed for the ensuing year. This amount he must compute as follows:

1. He must ascertain, in the manner provided for in subdivisions one and two of section one thousand eight hundred and fifty-eight, the total number of teachers for the county;

2. He must calculate the amount required to be raised at five hundred dollars per teacher; from this amount he must deduct the total amount of State apportionments, less ten per cent, received by the county for the next preceding school year, and the remainder shall be the minimum amount of County School Fund needed for the ensuing year; *provided*, that if this amount is less than sufficient to raise a sum equal to three dollars for each census child in the county, then the minimum amount shall be such a sum as will be equal to three dollars for each census child in the county.

1818. The Board of Supervisors, except of the City and County of San Francisco, of each county, must, annually, at the

time of levying other county taxes, levy a tax to be known as the County School Tax, the maximum rate of which must not exceed fifty cents on each one hundred dollars of taxable property in the county, nor the minimum rate be less than sufficient to raise the minimum amount reported by the County Superintendent, in accordance with the provisions of the preceeding section. The Supervisors must determine the minimum rate of the county school tax as follows:

1. They must deduct fifteen per cent from the equalized value of the last general assessment roll and the amount required to be raised, divided by the remainder of the assessment roll, is the rate to be levied; but if any fraction of a cent occur, it must be taken as a full cent on each hundred dollars.

1838. The Trustees, upon receiving the roll, must deduct fifteen per cent therefrom for anticipated delinquencies, and then by dividing the sum voted, together with the estimated cost of assessing and collecting added thereto, by the remainder of the roll, ascertain the rate per cent required, and the rate so ascertained (using the full cent on each hundred dollars in place of any fraction) is hereby levied and assessed to, on, or against the persons or property named or described in the roll, and is a lien on all such property until the tax is paid; and the tax, if not paid within the time limited by the next succeeding section for its payment, shall be delinquent, and must be collected in the manner prescribed in sections eighteen hundred and forty-five, eighteen hundred and forty-six, eighteen hundred and forty-seven, eighteen hundred and forty-eight, eighteen hundred and forty-nine, eighteen hundred and fifty, eighteen hundred and fifty-one, and eighteen hundred and fifty-two of this Code.

[New Section.]

1842. In case any Assessor or Collector of District taxes refuses or neglects to qualify within ten days after his election, or having qualified, refuses or neglects to act; or in case of any vacancy from any other cause, in either or both of said offices, the Board of Trustees shall call a special election, giving at least ten day's notice, to fill the place.

1845. When any school tax shall have become delinquent, the delinquent tax list, duly certified by the District Tax Collector of the school district in which the school tax has become

delinquent, shall be delivered to the District Attorney of the county in which the district is situated.

1846. It shall be the duty of the District Attorney of the county to commence a civil action, in the name of the People of the State of California, in any Courts of the county, to recover the delinquent taxes.

[New Section.]

1847. In such action a complaint substantially in the following form shall be sufficient.

[Title of Court.]
The People of the State of California
vs.
(Naming the defendant.)

Plaintiff avers that the defendant is indebted to the plaintiff in the sum of $———, district school tax for———School District, in the County of———, State of California, for the year 18—, and $———,costs of collection to date.

Plaintiff demands judgment in the sum of $———.

1848. If in such action the amount is paid, or the plaintiff recover judgment, then shall be endorsed on such judgment the sum of ten dollars as attorney's fees.

1849. In any action to enforce the collection of said tax, wherein any part of the tax is charged in the complaint to have been levied or assessed against, or to be a lien upon any real estate, or improvements on real estate, it shall be competent to proceed in rem against such realestate or improvements, or against both, such real estate being described in the summons in such a manner as to designate the particular tract or tracts of land sought to be charged, and in case of improvements, designating the tract of land on which the improvements are situated; and the description shall be sufficient, if it can be ascertained what land is intended, the summons also stating the amount of taxes claimed as a lien, and the year in which the taxes were assessed. Such summons need not name any particular defendant, but may be directed to all owners, known and unknown, of the property described; and such action may, at the option of the District Attorney, also proceed against any or all persons or corporation who are under obligation to pay the tax.

[New Section.]

1850. Service of summons, whether issued by the District Court or a Justice's Court, may be made by publication of a copy of the summons once a week for four successive weeks, in a newspaper published in the county in which the action is commenced. The service of the summons shall be complete at the expiration of the time of such publication.

[New Section.]

1851. Judgments rendered in such cases in the District Court shall be docketed and become liens upon all property of the defendant liable to taxation, and may be enforced against the same; and the District Attorney may file transcript of judgments rendered in Justice's Courts, under this Article, with the County Clerk, who shall, thereupon, docket such judgments, and they shall become liens from and after such docket entry, in the manner as judgment rendered in the District Court under this Article, and the County Clerk may issue execution on such docketed Justice's judgment as on judgments rendered in the District Court.

[New Section.]

1852. The law regulating proceedings in civil cases in the Courts of justice in this State, so far as the same is not inconsistent with the provisions of this Article, is hereby made applicable to proceedings under this Article; and any deed derived from a sale of real property, under this Act, shall be conclusive evidence of title, except as against actual frauds or prepayment of taxes, and shall entitle the holder thereof to a writ of assistance from the District Court to obtain possession of such property; *provided*, that the Sheriff, in selling said property, shall only sell the smallest quantity that any purchaser will take and pay the judgment and costs; *and, provided further*, that when property is sold belonging to minors or persons under legal disability, they shall have until one year after said disability is removed, to redeem said property, by paying the whole bid and all subsequent taxes and interest. All moneys collected in this behalf, except costs and charges, shall, without delay, be paid to the Treasurer of the county, for the use of the district in which the tax was levied; and the date thereof shall be entered opposite the proper name or property in the delinquent list, which shall be open to public inspection.

1858. All State school moneys apportioned by the Superintendent of Public Instruction, must be apportioned to the several counties in proportion to the number of school census children between five and seventeen years of age, as shown by the returns of the School Census Marshals of the preceding school year; *provided*, that Indian children who are not living under the guardianship of white persons, and Mongolian children, shall not be included in the apportionment list. The School Superintendent of each county must apportion all State and county school moneys as follows:

First—He must ascertain the number of teachers each district is entitled to, by calculating one teacher for every one hundred census children, or fraction thereof of not less than fifteen census children, as shown by the next preceding school census.

Second—He must ascertain the total number of teachers for the county, by adding together the number of teachers assigned to the several districts.

Third—Five hundred dollars shall be apportioned to each district for every teacher assigned it; *provided*, that to districts having ten and less than fifteen census children, shall be apportioned three hundred dollars only.

Fourth—All school moneys remaining on hand after apportioning five hundred dollars to each district having fifteen census children or more for every teacher assigned it, and after apportioning three hundred dollars to districts having ten and less than fifteen census children, must be apportioned to the several districts having not less than fifty census children, in proportion to the number of census children in each of said districts.

1859. On or after the first day of July, eighteen hundred and seventy-five, no school district is entitled to receive any apportionment of State or county school moneys, which has not maintained a public school for at least six months during the then next preceding school year; but any new district formed by the division of an old one, is entitled to its apportionment when the time that school, maintained in the old district before division, and in the new district after division, is equal to at least six months. Any school district which neglects or refuses to adopt and use the State series of text books, and State course of studies required by law, is not a school district within the meaning of this Article.

[New Section.]

1867. Any parent, guardian or other person, who shall insult, or abuse any teacher, in the presence of the school, shall be guilty of a misdemeanor, and be liable to a fine of not less than ten nor exceeding one hundred dollars.

[New Section.]

1868. Any person who shall willfully disturb any public

school, or any public school meeting, shall be guilty of a misdemeanor, and liable to a fine of not less than ten nor more than one hundred dollars.

[New Section.]

1869. Any State, County, or City, or City and County Superintendent, or any State, County, or City, or City and County Board of Examinations, who shall issue a certificate or diploma, except as provided for in this Title, shall be guilty of a misdemeanor.

1870. No officer named in this Title, or teacher in any public school held under the provisions of this Title, must act as agent for any author, publisher, bookseller or other person, to introduce any book, apparatus, furniture, or any other article whatever, in the common schools of this State, or any one or more of them, or directly or indirectly contract for or receive any gift or reward for so introducing or recommending the same; and any officer so acting or receiving, must be deemed guilty of a misdemeanor, and, on conviction, be punished by fine or imprisonment, and be removed from office.

1871. Diplomas or certificates shall be issued by any State, County, City, or City and County Board of Examination, to such persons only as shall have given evidence of good moral character.

1874. Any books once adopted as part of a uniform series of text-books must be continued in use for not less than four years; *provided*, that if at any time after their adoption, the retail price of such books is raised above the first introduction price, some other books shall be substituted for such books; *provided further*, that such substitution, or the adoption of new books in place of books which have been in use not less than four years must be in the following manner:

1. At least six months notice must be given of any proposed change of text-books.

2. Publishers of text-books must be invited to submit proposals for the supplying of the required text-books; said proposals must be accompanied by sample copies of the books proposed to be furnished, together with a statement of the retail price at which the books will be sold in this State for the full time for which the books are adopted.

3. If no proposals are received as required in the preceding subdivision, or if the books proposed to be furnished are inferior in contents or in binding, paper, typography, or presswork, or are to be sold at a higher retail price than the books already in use, then the books already in use must be continued in use.

Sections 1547, 1618, 1756, 1776 are repealed.

OFFICE OF CONTROLLER OF STATE,
Sacramento, California, March 3d, 1874.

Hon. H. N. Bolander, Superintendent of Public Instruction:

SIR: In accordance with an Act of the Legislature, I have the honor to report as follows:

The securities belonging to the School Fund, held in trust by the State Treasurer, consist of bonds of the State of California, bearing interest at legal rates, and amount to one million four hundred and seventeen thousand five hundred dollars ($1,417,500).

The statement showing the moneys in the State Treasury subject to apportionment, and the sources from which the same were derived, is as follows:

Interest on school lands	$33,244 33
Interest on bonds held in trust	44,280 00
Property tax (five cents and two mills on each one hundred dollars)	239,106 61
Subject to apportionment	$316,630 94

Very respectfully,

JAMES J. GREEN, Controller.

APPORTIONMENT.

Total number of census children between five and fifteen years of age entitled to receive school money, 141,610. Amount per child, $2 23.

ALAMEDA COUNTY.—Alameda, 405; Alvarado, 134; Alviso, 82; Bay, 58; Castro Valley, 51; Centreville, 106; Cosmopolitan, 64; Eden Vale, 52; Eureka, 116; Fruit Vale, 109; Inman, 63; Laurel, 289; Lincoln, 29; Livermore, 168; Lockwood, 72; May, 75; Midway, 6; Mission San José, 87; Mountain House, 61; Mowry's Landing, 46; Murray, 44; Oakland, 3,006; Ocean View, 128; Palmyras, 40; Peralta, 149; Pleasanton, 132; Redwood, 32; San Lorenzo, 163; Stony Brook, 18; Suñol, 61; Summit, 37; Temescal, 142; Townsend, 69; Union, 401; Vallecito, 72; Washington, 109; Warm Springs, 75. Total, 6,751; amount, $15,054 73.

ALPINE COUNTY.—Everett, 32; Franklin, 15; Lincoln, 43; Webster, 23. Total, 113; amount, $251 99.

AMADOR COUNTY.—Amador City, 148; Aqueduct City, 25; Buckeye Valley, 23; Buena Vista, 62; Clinton, 31; Drytown, 73; Fiddletown, 113; Franklin, 29; Forest Home, 52; Ione Valley, 115; Jackson, 192; Jackson Valley, 29; Lancha Plana, 8); Mountain Echo, 24; Mountain Spring, 32; Milligan's, 42; New York Ranch, 31; Oneida, 89; Plymouth, 120; Pine Grove, 49; Sutter Creek, 312; Stony Creek, 16; Union, 53; Upper Rancharia, 36; Volcano, 187; William, 45; Willow Springs, 40; Washington, 77. Total, 2,134; amount, $4,758 82.

BUTTE COUNTY.—Antelope, 31; Bangor, 46; Bidwell, 29; Butte Valley, 47; Cañon Creek, 40; Centerville, 23; Central House, 37; Chico, 448; Cherokee, 142; Clipper Mills, 32; Cottonwood, 31; Dayton, 81; Delaplain, 55; Eureka, 26; Evansville, 26; Fairview, 28; Forbestown, 56; Franklin, 13; Gridley, 42; Hamilton, 135; Inskip, 25; Kimshew, 42; Live Oak, 20; Lone Tree, 45; Little Chico, 56; Lovelock, 43; Manzanita, 31; Meridian, 84; Mesilla Valley, 31; Morris' Ravine, 25; Mountain Spring, 65; Ninshew, 13; Mud Creek, 41; Oroville, 283; Oregon City, 50; Pine Creek, 43; Rio Seco, 70; Rock Creek, 38; Salem, 24; Stoneman, 33; Union, 30; Upham, 21; Webster, 40; West Liberty, 70; Wyandotte, 72; Wyman's Ravine, 33; York, 11. Total, 2,707; amount, $6,036 61.

CALAVERAS COUNTY.—Angels, 233; Altaville, 108; Black Hills, 21; Brushville, 18; Camanche, 122; Copperopolis, 113; Chili Gulch, 61; Cave City, 52; Calaveritas, 57; Campo Seco, 66; Douglass Flat, 54; Eureka, 75; Fourth Crossing, 60; Jenny Lind, 73; Mokelumne Hill, 203; Murphys, 112; Mosquito Gulch, 24; Milton, 25; Negro Gulch, 52; Pleasant Springs, 16; Petersburg, 79; Palomo, 57; Robinson's Ferry, 18; San Andreas, 168; Sheep Ranch, 37; Spring Valley, 29; Salt Spring Valley, 35; Telegraph City, 37; Vallecito, 111; Washington Ranch, 34; West Point, 65. Total, 2,215; amount, $4,939 45.

COLUSA COUNTY.—Ashton, 31; Antelope, 37; Bear Valley, 29; Butte Creek, 20; Black Butte, 25; Bridgeport, 33; Central, 23; Colusa, 250; Dry Slough, 66; Excelsior, 24; Emigrant, 50; Fairview, 24; Freshwater, 85; Franklin, 54; Grindstone, 22; Grand Island, 45; Indian Valley, 40; Independent, 41; Jacinto, 64; Jefferson, 26; Johns, 36; Jackson, 43; Kanawha, 25; Liberty, 27; Lake, 19; Montgomery, 43; Marion, 29; Mountain, 26; Newland, 38; Newville, 56; Plaza, 40; Princeton, 81; Prairie, 15; Stony Creek, 11; Union, 59; Washington, 59: Willow, 39; Webster, 51. Total, 1,686; amount, $3,759 78.

CONTRA COSTA COUNTY.—Alamo, 50; Amador, 25; Antioch, 166; Alhambra, 48; Bay Point, 58; Brenes Valley, 52; Carbondale, 169; Central, 45; Concord, 103; Danville. 36; Deer Valley, 29; Excelsior, 84; Eden Plain, 61; Green Valley, 47; Iron House, 37; Lafayette, 57; Liberty, 43; Lime Quarry, 52; Lone Tree, 43; Martinez, 146; Moraga, 36; Morgan Territory, 38; Mt. Diablo, 114; Mt. Pleasant, 74; Oak Grove, 54; Pinole, 74; Pleasant Hill, 39; Pacheco, 119; Rodeo Valley, 27; San Ramon, 65; San Pablo, 288; Somersville, 174; Sycamore, 42; Tassajar, 56; Willow Springs, 52. Total, 2,603; amount, $5,804 69.

DEL NORTE COUNTY.—Creseent, 173; Rowdy Creek, 22; Bradford, 48; Happy Camp, 37; Lineoln, 28; Oecan, 23; Fort Diek, 17. Total, 348; amount, $776 04.

EL DORADO COUNTY.—Buckeye Flat, 58; Blair's, 59; Bear Creek, 27; Carson Creek, 23; Cold Springs, 33; Coloma, 155; Coon Hollow, 66; Diamond Springs, 56; El Dorado, 108; French Creek, 39; Garden Valley, 34; Greenwood, 61; Georgetown, 156; Green Valley, 37; Gold Hill, 64; Indian Diggings, 29; Jayhawk, 63; Kelsey, 71; Lake Valley, 43; Latrobe, 76; Missouri Flat, 17; Mountain, 49; Mount Aukum, 57; Mosquito, 12; Nashville, 32; Natoma, 27; Newtown, 20; Oak Hill, 48; Pilot Hill, 37; Placerville, 337; Pleasant Valley, 82; Reservoir, 51; Salmon Falls, 43; Smith's Flat, 34; Spanish Dry Diggings, 24; Tennessee, 43; Uniontown, 56; United, 58; Wild Goose, 19. Total, 2,304; amount, $5,137 92.

FRESNO COUNTY.—Areola, 24; Centerville, 30; Chowchilla, 38; Dalton, 26; Dry Creek, 75; Fancher, 28; Fresno, 52; Fresno City, 30; Georgiaville, 27; Hazleton, 19; Kingston, 49; Lake, 64; Millerton, 156; New Idria, 106; Panoche, 75; Pleasant Vale, 56; Pleasant Valley, 45; San Joaquin, 38; Scottsburg, 43; Squaw Valley, 34; Washington, 40. Total, 1,055; amount, $2,352 65.

HUMBOLDT COUNTY.—Mad River, 64; Janes, 52; Bay, 25; Union, 201; Eureka, 481; Peninsula, 16; Elk River, 55; Bucksport, 34; Salmon Creek, 32; Table Bluff, 68; Pacific, 28; Slide, 50; Rohnerville, 133; Hydesville, 121; Yager Creek, 44; Laribee, 28; South Fork, 106; McDiarmid's Prairie, 38; Van Dusen, 30; Grizzly Bluff, 51; Island, 47; Grant, 38; Ferndale, 89; Centerville, 37; Bear River, 32; Mattole, 101; Upper Mattole, 58. Total, 2,059; amount, $4,591 57.

INYO COUNTY.—Bishop Creek, 59; Irving, 21; Independence, 30; Lone Pine, 80; Milton, 36; Round Valley, 28; Union, 40. Total, 294; amount, $655 62.

KERN COUNTY.—Havilah, 30; Kernville, 31; Linn's Valley, 124; Kern Island, 227; Tehachipah, 68; Wicker, 29; Fitzgerald, 81; Weldon, 24. Total, 614; amount, $1,369 22.

KLAMATH COUNTY.—Klamath, 71; Trinidad, 57; Orleans, 79; Dows' Prairie, 36; Bald Hills, 33. Total, 276; amount, $615 48.

LAKE COUNTY.—Morgan Valley, 30; Lower Lake, 78; Barns Valley, 22; Excelsior, 24; Loconomi, 62; Rincon, 51; Uncle Sam, 72; Kelsey Creek, 46; Big Valley, 35; Lakeport, 79; Pleasant Grove, 46; Blue Lake, 27; Upper Lake, 149; Bachelor Valley, 64; Cobb Valley, 18; Middletown, 107; Spruce Grove, 27; Ashland, 25; Gravelly Valley, 11; Mountain, 27; Scott's Valley, 21. Total, 1,021; amount, $2,276 83.

LASSEN COUNTY.—Susanville, 124; Susan River, 82; Janesville, 45; Soldier's Bridge, 27; Dake, 35; Milford, 35; Long Valley, 24; Willow Creek, 32; Providence, 128; Pleasant Butte, 22. Total, 554; amount, $1,235 42.

LOS ANGELES COUNTY.—Alameda, 114; Anaheim, 264; Azusa, 115; Ballona, 153; Bolsa Grande, 25; Bog Dale, 64; Cienega, 129; Duarte, 44; El Monte, 154; Fair View, 45; Green Meadows, 135; La Puenta, 99; La Dow, 57; Los Angeles, 2,050; Little Lake, 29; Los Nietos, 134; Maizeland, 70; New River, 78; New Port, 65; Old Mission, 137; Orangethorpe, 32; Palomares, 168; Rich-

land, 86; Ranchito, 91; Rowland, 105; Santa Ana, 218; San Antonio, 99; San Fernando, 86; San Gabriel, 214; San Juan, 181; San José, 111; San Pedro, 142; Silver, 135; Solidad, 77; Spring, 89; Sycamore, 21; Westminster, 39; Wilmington, 129; Vernon, 117. Total, 6,101; amount, $13,605 23.

MARIN COUNTY.—American Valley, 23; Aurora, 51; Bay View, 76; Bolinas, 34; Chileno Valley, 48; Clark, 49; Dixie, 162; Estero, 37; Franklin, 35; Garcia, 48; Halleck, 47; Laguna, 28; Lincoln, 15; Novato, 53; Nicacio, 61; Olema, 23; Point Reyes, 36; Richardson, 57; Ross Landing, 49; San Rafael, 274; San Quentin, 41; San Antonio, 41; San Jeronimo, 10; Saucelito, 48; Tomales, 64. Total, 1,410; amount, $3,144 30.

MARIPOSA COUNTY.—Mariposa, 152; Hornitos, 155; Bear Valley, 79; Coulterville, 82; Yosemite, 74; Granite Springs, 32; Sherlocks, 28; Sebastopol, 73; Pea Ridge, 70; Carthay's Valley, 54; Elkhorn, 39; Quartzburg, 52; Merced Falls, 38; Princeton, 28. Total, 956; amount, $2,131 88.

MENDOCINO COUNTY.—Anderson, 96; Albion, 13; Big River, 78; Bridgeport, 23; Buchanan, 154; Big Rock, 14; Cahto, 48; Calpello, 23; Caspar, 35; Central, 64; Counts, 52; Coyote, 29; Cuffey's Cove, 46; Eel River, 59; Elkhorn, 24; Fishrock, 30; Farley, 42; Gaskill, 45; Gualalla, 26; Indian Creek, 30; Little Lake, 53; Little River, 28; Lima, 19; Long Valley, 39; Manchester, 112; Mill Creek, 45; Nevarro, 37; Noyo, 20; Oriental, 62; Potter Valley, 42; Prairie Camp, 24; Rancheria, 54; Redwood, 62; Round Valley, 125; Sanel, 87; Sherwood Valley, 75; Ten Mile River, 67; Ukiah, 331; Union, 52; Walker Valley, 19; Upper Little Lake, 67; Willittsville, 56. Total, 2,407; amount, $5,367 61.

MERCED COUNTY.—Anderson, 55; Bear Creek, 20; Clay, 29; Eden, 20; Fairview, 28; Hopeton, 57; Jefferson, 67; Lone Tree, 44; Los Baños, 122; Madison, 22; Mariposa, 66; Merced, 138; Merced Falls, 26; McSwain, 34; Monroe, 31; Pioneer, 24; Plainsburg, 29; Snelling, 85; Washington, 30. Total, 927; amount, $2,067 21.

MONO COUNTY.—North Antelope, 14; Antelope, 25; Bridgeport, 27; Benton, 24. Total, 90; amount, $200 70.

MONTEREY COUNTY.—Alisal, 81; Carmelo, 96; Carrolton, 84; Carneros, 71; Castroville, 203; Erie, 41; Fairview, 48; Hollister, 304; Jefferson, 112; Lindley, 91; Live Oak, 54; Lone Tree, 37; Long Valley, 76; Monterey, 292; Mountain, 71; Natividad, 110; Oak Grove, 72; Pacheco, 55; Rincon, 53; San Juan, 234; San Antonio, 77; San Felipe, 9; Springfield, 36; Spring, 42; San Benito, 63; Santa Rita, 121; Salinas City, 349; Soledad, 112; Santa Ana, 64; Sycamore Spring, 68; Tres Pinos, 84; Washington, 113; San Miguel, 46; Priest Valley, 27; Bernabe, 67; Peach Tree, 52; Jacks, 40; Red Rock, 48; Union, 40. Total, 3,643; amount, $8,123 89.

NAPA COUNTY.—Buchanan, 95; Berryessa, 44; Bennett, 61; Carnaros, 34; Calistoga, 99; Childs, 56; Cherry Valley, 13; Capelle Valley, 21; Chiles Valley, 19; Conn Valley, 14; Cinnabar, 32; Franklin, 10; Foss Valley, 27; Gorton, Valley, 25; Howard, 32; Harmony, 44; Jefferson, 31; Liberty, 42; Lodi, 38; Mountain, 8; Napa City, 585; Oakville, 32; Oak Grove, 25; Pope Valley, 45; Putah, 32; Redwood, 71; Rag Cañon, 8; Suscol, 49; St. Helena, 218; Soda Cañon, 28; Salvador, 31; Sulphur Springs, 36; Spring Mountain, 27; Tucker, 29; Teal, —; Upper Pope Valley, 46; Vineland, 54; Wooden Valley, 26; Yount, 22. Total, 2,109; amount, $4,703 07.

NEVADA COUNTY.—Allison Ranch, 148; Boca, 26; Birchville, 56; Blue Tent, 29; Bear River, 23; Chalk Bluff, 40; Clear Creek, 33; Cherokee, 65; Columbia Hill, 61; Eureka, 98; Forest Springs, 146; French Corral, 81; Greeley, 16; Grass Valley, 861; Graniteville, 18; Indian Springs, 58; Kentucky Flat, 76; Little York, 52; Lime Kiln, 21; Liberty Hill, 25; Lake City, 36; Moore's Flat, 83; Mooney Flat, 44; Nevada, 702; North San Juan, 154; North Bloomfield, 127; North Star, 108; Oakland, 146; Omega, 53; Pleasant Valley, 35; Quaker Hill, 29; Rough and Ready, 73; Relief Hill, 30; Sebastopol, 44; Spencerville, 42; Sweetland, 84; Truckee, 208; Union Hill, 118; Washington, 57; Willow Valley, 48. Total, 4,154; amount, $9,263 42.

PLACER COUNTY.—Auburn, 172; Alta, 25; Bath, 36; Blue Cañon, 28; Central, 30; Coon Creek, 61; Christian Valley, 32; Colfax, 124; Dry Creek, 13; Deadwood, 13; Dutch Flat, 156; Damascus, 21; Emigrant Gap, 21; Excelsior, 25; Franklin, 23; Forest Hill, 155; Fair View, 5; Gold Hill, 23; Gold Run, 76; Iowa Hill, 97; Last Chance, 10; Lisbon, 32; Lincoln, 52; Lone Star, 27; Mich-

igan Bluff, 55; Mount Pleasant, 35; Neilsburg, 36; Newcastle, 47; Norwich, 46; Ophir, 112; Pleasant Grove, 17; Penryn, 40; Rattlesnake, 56; Rock Creek, 58; Rocklin, 87; Roseville, 64; Smithville, 28; Todds Valley, 68; Union, 28; Valley View, 23; Wisconsin Hill, 37; Washington, 26; Yankee Jims, 46. Total, 2,166; amount, $4,830 18.

PLUMAS COUNTY.—Antelope, 26; Beckworth, 32; Big Meadows, 12; Clover Valley, 14; Crescent, 54; East Branch, 14; Greenville, 73; Hot Spring, 25; La Porte, 104; Lassen Buttes, 21; Lincoln, 23; Mohawk, 20; Pilot Peak, 14; Pioneer, 27; Quincy, 85; Rocky Point, 14; Seneca, 13; Spanish Peak, 50; Sulphur Spring, 14; Summit, 25; Taylor, 67; Union, 17; Island, 17. Total, 761; amount, $1,697 03.

SACRAMENTO COUNTY.—Alabama, 46; American, 15; American River, 97; Antelope, 11; Ashland, 28; Brannan, 27; Brighton, 29; Buckeye, 28; Carson Creek, 38; Center, 20; Davis, 19; Dry Creek, 13; Elder Creek, 47; Elk Grove, 58; Enterprise, 64; Excelsior, 43; Franklin, 55; Freeport, 37; Galt, 41; Georgiana, 24; Granite, 118; Grant, 30; Hicksville, 33; Homewood, 13; Hutson, 12; Jackson, 32; Katesville. 18; Kinney, 73; Laguna, 8; Lee, 23; Lincoln, 30; Lisbon, 35; Michigan Bar, 68; Mokelumne, 16; Natoma, 27; Oak Grove, 26; Onisbo, 43; Pacific, 27; Pleasant Grove, 75; Point Pleasant, 41; Prairie, 36; Rhoades, 19; Richland, 32; San Joaquin, 45; Sherman, 46; Stone House, 31; Sutter, 80; Sylvan, 71; Sacramento, 3,292; Union, 29; Viola, 52; Washington, 69; Walnut Grove, 31; West Union, 33; White Rock, 37; Wilson, 34. Total, 5,425; amount, $12,097 75.

SAN BERNARDINO COUNTY.—American, 41; Central, 52; Chino, 142; City, 312; City Creek, 46; Cram, 34; Cucamungo, 40; Jarupa, 51; Juapa, 65; Mill, 49; Mission, 80; Mount Vernon, 144; Riley, 87; Riverside, 47; San Salvador, 125; San Timotco, 86; Temescal, 38; Warm Spring, 75; Washington, 48. Total, 1,562; amount, $3,483 26.

SAN DIEGO COUNTY.—Bear Valley, 46; Ballena, 47; Banner, 40; Cajon, 35; East San Diego, 59; Hope, 11; Jamul, 15; Julian, 77; Milquatay, 20; Monserrate, 101; National, 34; New San Diego, 336; Paguay, 38; Potrero, 59; San Diego, 161; San Dieguita, 25; San Jacinto, 48; San Luis Rey, 145. Total, 1,297; amount, $2,892 31.

SAN FRANCISCO COUNTY.—Total, 34,469; amount, $76,865 87.

SAN JOAQUIN COUNTY.—August, 50; Athearn, 49; Alpine, 30; Bellota, 51; Brunswick, 49; Burwood, 21; Calaveras, 26; Corral Hollow, 58; Castle, 27; Chartville, 42; Charity Dale, 18; Central, 8; Columbia, 35; Davis, 40; Douglas, 38; Dry Creek, 13; Delphi, 63; Elliott, 64; Elkhorn, 32; Everett, 48; Enterprise, 16; French Camp, 50; Franklin, 34; Fairview, 20; Greenwood, 41; Grant, 42; Henderson, 41; Home, 21; Harmony Grove, 45; Hutson, 8; Houston, 62; Linden, 118; Liberty, 43; Live Oak. 27; Lincoln, 29; Lone Tree, 19; Lafayette, 33; Lockeford, 75; Moore, 42; Madison, 39; Montezuma, 31; Mokelumne, 16; Mount Carmel, 38; McKarney, 52; New Jerusalem, 36; New Hope, 22; North, 42; Rising Sun, 17; Pacific, 20; Rustic, 25; River, 25; Stockton, 1,779; South, 58; Salem, 80; Shady Grove, 33; San Joaquin, 30; Telegraph, 48; Tulare, 46; Turner, 50; Union, 46; Valley, 89; Vineyard, 10; Van Allen, 41; Woods, 52; Wheatland, 25; Washington, 43; Wildwood, 46; Weber, 47; Willow, 60; Zinc House, 65; Midway, 20; Jefferson, 50. Total, 4,609; amount, $10,278 07.

SAN LUIS OBISPO COUNTY.—Arroyo Grande, 164; Central, 45; Excelsior, 65; Estrella, 42; Franklin, 58; Hesperian, 72; Hope, 63; Josephine, 41; Los Osos, 34; Mission, 433; Mammoth Rock, 28; Olmstead, 38; Santa Fé, 164; Santa Rosa, 43; San José, 100; San Miguel, 23; Salinas, 30; San Simeon, 86; Summit, 64; Washington, 40. Total, 1,633; amount, $3,641 59.

SAN MATEO COUNTY.—San Bruno, 70; San Mateo, 168; Belmont, 42; Redwood City, 458; Searsville, 95; Greersburg, 49; Laguna, 92; Halfmoon Bay, 349; Purissima, 88; West Union, 18; Jefferson, 68; Millbrae, 59; Tunis, 57; San Gregorio, 29; Peseadero, 136; Bell, 46: New Year, 1; San Pedro, 63; Summit Springs, 23; Seaside, 24; New Bell, 43. Total, 1,978; amount, $4,410 94.

SANTA BARBARA COUNTY.—Santa Barbara, 896; Montecito, 146; Carpinteria, 130; Rafaela, 167; Graciosa, 143; Hope, 86; Pine Grove, 138. Total, 1,706; amount, $3,804 38.

SANTA CLARA COUNTY.—Adams, 76; Alviso, 128; Berryessa, 61; Braly, 54; Burnett, 47; Calaveras, 18; Cambrian, 57; Carneadero, 55; Collins, 34; Eagle,

51; Encinal, 31; Evergreen, 88; Franklin, 39; Gilroy, 456; Guadalupe, 72; Hacienda, 102; Hamilton, 60; Hester, 324; Highland, 87; Hill, 267; Jackson, 76; Jefferson, 78; Laguna, 45; Lexington, 33; Live Oak, 71; Llagas, 62; Los Gatos, 103; Lincoln, 62; Mayfield, 230; Millikin, 58; Milpitas, 116; Mooreland, 50; Mountain View, 142; Mount Pleasant, 33; Midway, 40; Oak Grove, 89; Orchard Street, 105; Pala, 69; Pioneer, 77; Rhoades, 60; Saratoga, 114; San Antonio, 31; Santa Clara, 512; San Felipe, 42; San José, 1,972; San Ysidro, 100; Sierra, 28; Silver Creek, 42; Summit, 22; Union, 59; Whisman, 53; Willow Glen, 81. Total, 6,762; amount, $15,079 26.

SANTA CRUZ COUNTY.—Santa Cruz, 722; Pajaro, 579; San Andreas, 59; Mountain, 49; Corralitos, 121; Petroleum, 19; Happy Valley, 40; Hazel Brook, 21; El Jarro, 37; Railroad, 31; Scott's Valley, 31; San Lorenzo, 68; Bay View, 83; Green Valley, 74; Carlton, 65; Soquel, 171; San Vicente, 24; Union, 63; Casserly, 47; Summit, 38; Aptos, 68; Roache, 79; Boulder Creek, 39; Vine Hill, 35; Agua Puerca, 30; Hill, 33; Live Oak, 51. Total, 2,677; amount, $5,969 71.

SHASTA COUNTY.—American Ranch, 12; Buckeye, 29; Burney Valley, 31; Clover Creek, 50; Cow Creek, 44; Bald Hill, 42; Cañon House, 91; Cottonwood, 13; Eagle Creek, 46; French Gulch, 63; Fall River, 83; Millville, 125; Round Mountain, 39; Klotz Mill, 49; Oak Knoll, 24; Piety Hill, 52; Parkville, 47; Pit River, 52; Roaring River, 17; Shasta, 209; Stillwater, 35; Sierra, 46; Sacramento River, 29; Sheldon, 10; Whisky Creek, 28; Centreville, 60. Total, 1,327; amount, $2,959 21.

SIERRA COUNTY.—Allegbany, 72; Alpine, 24; Alta, 21; Antelope, 11; Butte, 50; Downieville, 173; Eureka, 28; Forest, 55; Gibsonville, 28; Goodyear, 46; Loyalton, 60; Minnesota, 18; Morristown, 9; Mount Pleasant, 22; Newark, 32; Plum Valley, 28; Poker Flat, 16; Rocky Point, 29; Sierraville, 75; St. Louis, 41; Table Rock, 57; Union, 55; Washington, 30. Total, 980; amount, $2,185 40.

SISKIYOU COUNTY.—Adin, 80: Ash Creek, 20; Berryvale, 25; Big Valley, 35; Bogus, 30; Butteville, 40; Cedar Park, 32; Cedarville, 40; Center, 55; Centerville, 55; Cottonwood, 35; Deep Creek, 42; Dorrisville, 42; Doton, 30; Douglas, 50; Eagleville, 60; East Fork, 18; Fall River, 20; Franklin, 35; Goose Lake, 40; Hawkinsville, 25; Hot Springs, 50; Humbug, 18; Klamath, 18; Lake City, 75; Lassen Creek, 25; Lincoln, 60; Little Shasta, 75; Meamber, 35; Moffatt Creek, 20; Mount Bidwell, 30; Mount Shasta, 20; Nevada, 40; Oregon, 50; Oro Fino, 40; Overton, 40; Pitt River, 40; Quartz Valley, 25; Riceland, 30; Round Valley, 30; Scott River, 52; Scott Valley, 95; Shasta Valley, 25; Sciad Valley, 18; South Fork, 45; Stone Coal Valley, 25; Surprise Valley, 30; Table Rock, 55; Union, 20; Vineland, 30; Washington, 55; Willow Creek, 40; Yreka, 380. Total. 2,400; amount, $5,352 00.

SOLANO COUNTY.—Alamo, 37; American Cañon, 27; Benicia 98; Binghamton, 54; Bunker Hill, 75: Crystal, 203; Center, 49; Collinsville, 23; Canright, 25; Dover, 28; Denverton, 18; Dixon, 146; Egbert, 41; Esmeralda, 23; Enterprise, 22; Fairfield, 99; Grant, 63; Green Valley, 63; Gomer, 19; King, 42; Mountain, 19; Maine Prairie, 40; Montezuma, 27; Oak Dale, 31; Owens, 35; Pitts, 57; Putah, 12; Pleasant Valley, 24; Peaceful Glen, 33; Rio Vista, 124; Rockville, 50; Round Hill, 37; Salem, 37; Silveyville, 81; Solano, 50; Suisun, 42; Tremont, 69; Ulatus, 113; Union, 69; Vallejo, 1,280; Wolfskill, 31. Total, 3,716; amount, $8,286 68.

SONOMA COUNTY.—Alexander, 38; Alpine, 29; American Valley, 32; Bloomfield, 117; Bodega, 33; Burns, 26; Burnside, 45; Canfield, 14; Cinnabar, 50; Cloverdale, 209; Coleman Valley, 48; Copeland, 37; Court House, 568; Dry Creek, 24; Dunham, 60; Dunbar, 46; Eagle, 30; Enterprise, 42; Fisk's Mill, 48; Freestone, 58; Geyserville, 69; Grape, 44; Green Valley, 44; Guilford, 45; Guillicos, 8; Hall, 40; Hamilton, 55; Harvey, 48; Healdsburg, 407; Hearn, 17; Hill, 52; Independence, 26; Iowa, 33; Junction, 28; Knight's Valley, 20; Laguna, 93; Lafayette, 44; Lake, 34; Lakeville, 46; Lewis, 33; Liberty, 41; Lone Redwood, 35; Manzanita, 57; Mark West, 62; Marin, 33; Mayaccama, 25; Mendocino, 61; Mill Creek, 42; Miriam, 161; Monroe, 25; Mountain, 18; Mount Vernon, 24; Oak Grove, 76; Occidental, 40; Oriental, 49; Pacific, 16; Payran, 78; Petaluma, 730; Piner, 41; Pleasant Hill, 25: Potter, 85; Redwood, 91; Rincon, 29; Russian River, 28; San Antonio, 52; Santa Rosa, 29; Scotta, 71; Sonoma, 280; Sotyome, 60; Starr, 30; Spring Hill, 40; Steuben, 40; Stewart's Point, 31; Stony Point, 21; Strawberry, 48; Tar Water, 54; Todd, 44; Walker,

47; Wallace, 26; Wallula, 84; Washington, 43; Watmaugh, 32; Waugh, 29; Wilson, 63; Watson, 26; Wright, 29; Windsor, 108. Total, 5,899; amount, $13,154 77.

STANISLAUS COUNTY.—Adamsville, 55; Bachelor Valley, 47; Bonita, 42; Belpassc, 51; Booth, 22; Black Hills, 24; Buena Vista, 46; Branch, 105; Dry Creek, 20; Davis, 41; Empire, 28; Emery, 78; Farm Cottage, 33; Fair View, 64; Garner, 39; Greyson, 35; Grant, 42; Haight, 32; Hoar's Ranch, 21; Home Union, 13; Jackson, 44; Jones, 56; Junction, 52; Jefferson, 42; McHenry, 49; Modesto, 178; Oristimba, 77; Oak Dale, 63; Paradise, 29; Rowe, 28; Rhinehart, 31; Rising Sun, 20; Tuolumne, 52; Washington, 71; White Crow, 44; White Oak, 38. Total, 1,712; amount, $3,817 76.

SUTTER COUNTY.—Auburn, 44; Barry, 36; Bear River, 24; Brown's, 43; Brittan, 38; Buttesylvania, 21; Central, 60; Columbia, 31; Eagle, 26; Fair View, 19; Franklin, 15; Gaither, 62; Grant, 41; Illinois, 39; Knight's, 26; Jefferson, 28; Lee, 20; Lincoln, 45; Live Oak, 21; Marcum, 32; Meridian, 55; Myers, 34; Nicolaus, 52; North Butte, 29; Prairie, 15; Rome, 33; Salem, 15; Slough, 41; Sutter, 29; Union, 35; Vernon, 22; Washington, 44; West Butte, 49; Winship, 36; Yuba, 130. Total, 1,290; amount, $2,876 70.

TEHAMA COUNTY.—Red Bluff, 373; Tehama, 107; Antelope, 68; Lassen, 45; Cottonwood, 31; Coast Range, 72; Sierra, 64; Orion, 38; Washington, 32; Montgomery, 31; Floyd's, 31; Stony Creek, 38; Paskenta, 49; Oat Creek, 34; Sanders' Bend, 19; Toomes, 21; Hunter's, 44; Red Bank, 57; Reed's Creek, 40. Total, 1,194; amount, $2,662 62.

TRINITY COUNTY.—Weaverville, 175; Douglas City, 71; Hay Fork, 69; Lewiston, 62; Junction City, 56; North Fork, 40; Trinity Center, 22; Cox's Bar, 20; Hyampom, 15. Total, 530; amount, $1,181 90.

TULARE COUNTY.—Cottonwood, 72; Deep Creek, 57; Elbow, 33; Elbow Creek, 85; Fitzgerald, 93; Farmersville, 41; Kaweah, 68; King's River, 25; Outside Creek, 21; Oak Grove, 33; Packwood, 20; Rockford, 44; Tule River, 99; Union, 43; Visalia, 368; Venice, —; Vandalia, 126; Willow, 39; Harmony, 51; Mountain View, 84; Pioneer, 50; Plain, 15; Antelope, 47; Pleasant Grove, 54; Sand Creek, 44; Elder, 29; Wicker, 14; Yokahl, 49; Lake, 47. Total, 1,751: amount, $3,904 73.

TUOLUMNE COUNTY.—Sonora, 452; Columbia, 313; Jamestown, 131; Tuttletown, 107; Big Oak Flat, 117; Chinese Camp, 66; Poverty Hill, 91; Curtis Creek, 69; Shaw's Flat, 44; Confidence, 35; Soulsbyville, 39; Springfield, 51; Summersville, 42; Green Springs, 49; Montezuma, 35; Willow Springs, 34; Don Pedro's Bar, 42; Blanket Creek, 44; Moccasin Creek, 33. Total, 1,794; amount, $4,000 62.

VENTURA COUNTY.—Ocean, 77; Briggs, 31; Pleasant Valley, 73; Live Oak, 19; Santa Paula, 53; Sespe, 89; Santa Clara, 45; San Pedro, 73; Huenema, 47; San Buenaventura, 402; Ojai, 28. Total, 937; amount, $2,089 51.

YOLO COUNTY.—Woodland, 402; Buchanan, 36; Washington, 151; Cottonwood, 59; Prairie, 46; Cache Creek, 34; Grand Island, 7; Merritt, 30; Grafton, 125; Union, 44; Franklin, 25; Putah, 38; Buckeye, 45; Fillmore, 39; Plainfield, 73; Willow Slough, 30; Monument, 20; Pine Grove, 29; Cañon, 39; Woodland Prairie, 17; Sacramento River, 25; Monitor, 37; Eureka, 56; Gordon, 58; Capay, 64; Fairfield, 30; Enterprise, 14; Liberty, 34; Vernon, 21; Pleasant Prairie, 34; Fairview, 34; Spring Lake, 21; Yolo, 111; Mount Pleasant, 29; North Grafton, 46; Clover, 32; Montgomery, 29; Lisbon, 36; Haight, 22; Cacheville, 59; Center, 38. Total, 2,119; amount, $4,725 37.

YUBA COUNTY.—Bear River, 91; Brophys, 42; Brown's Valley, 34; Buckeye, 46; Clark, 24; Cordua, 41; Dobbin's Ranch, 34; Elizabeth, 31; Greenville, 26; Hausonville, 24; Honcut, 32; Indiana Ranch, 41; Junction, 29; Linda, 41; Long Bar, 26; Lone Tree, 45; McDonald's, 21; New York, 41; Oak Valley, 38; Oregon House, 40; Peoria, 39; Plumas, 53; Rose Bar, 185; Sharon Valley, 68; Slate Range, 123; Spring Valley, 42; Strawberry Valley, 29; Virginia, 35; Woodville, 7; Yuba, 43; Marysville, 1,014. Total, 2,385; amount, $5,318 55.

HENRY N. BOLANDER,
Superintendent of Public Instruction.

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THE

CALIFORNIA TEACHER.

MAY, 1874.

VOL. XI. SACRAMENTO. No. 11

COMPULSORY EDUCATION.

AN ACT TO ENFORCE THE EDUCATIONAL RIGHTS OF CHILDREN.

[Approved March 28, 1874.]

The People of the State of California, represented in Senate and Assembly, do enact as follows:

SECTION 1. Every parent, guardian or other person in the State of California, having control and charge of any child or children, between the ages of eight and fourteen years, shall be required to send any such child or children to a public school for a period of at least two thirds of the time during which a public school shall be taught in each city or city or county, or school district, in each school year, commencing on the first day of July, in the year of our Lord, one thousand eight hundred and seventy-four, at least twelve weeks of which shall be consecutive, unless such child or children are excused from such attendance by the Board of Education of the city or city and county, or of the Trustees of the school district in which such parents, guardians or other persons reside, upon its being shown to their satisfaction that his or her bodily or mental condition has been such as to prevent attendance at school or application to study, for the period required, or that the parents or guardians, are extremely poor, or sick, or that such child or children are taught in a private school, or at home, in such branches as are usually taught in the primary schools of this State, or have already acquired a good knowledge of such branches; *provided*, in case a public school shall not be taught for three months during the year, within one mile by the nearest traveled road, of the residence of any person within the school district, he shall not be liable to the provisions of this Act.

SECTION 2. It shall be the duty of the President of each Board of Education and of the Clerk of each Board of District Trustees, in the State of California, to cause to be posted three notices of this law, in the most public places in the city, or city and county, or in the school district, or published in one newspaper therein for three weeks in the month of June, in each year, the expense of each publication, to be paid out of the school funds of such city or city and county, or school district, as the case may require.

SECTION 3. In case any parent, or guardian or other person, shall fail to comply with the provisions of this Act, said parent, guardian or other person, shall be deemed guilty of a misdemeanor, and shall be liable to a fine of not more than twenty dollars, and for the second and each subsequent offense, the fine shall not be less than twenty dollars nor more than fifty dollars; and the parent, guardian and other person so convicted, shall pay all costs. Each such

fine shall be paid to the Clerk of the proper Board of Education, or of the District Trustees.

SECTION 4. And it shall be the duty of the Clerk of each Board of Education, and of each Board of District Trustees, on complaint of any teacher or taxpayer, to prosecute all offenses occurring under the provisions of this Act; and any Clerk neglecting to prosecute such offense within ten days after a written notice has been served on him by any teacher or taxpayer within the limits of the authority of said Board, unless the person so complained of shall be excused by the proper school Board, shall himself be liable to a fine of not less than twenty dollars nor more than fifty dollars, which fine shall be prosecuted for and in the name of the People of the State of California, and the fine so collected shall be paid over to the Clerk of the Board of Education or Trustees of the proper city, or city and county, or school district, to be accounted for as in section three of this Act; and in case such prosecution fail, the expenses thereof shall be paid out of the School Fund of the city, or city and county, or school district in which the case arose.

SECTION 5. And it shall be the duty of the Census Marshal to furnish each Board of Education, and of District Trustees, with a complete list of all children living within the jurisdiction of said Board, and to note on such lists all children not attending colleges, college schools, private schools, or being taught at home, who are not liable to the provisions of this Act, and each teacher teaching within the limits of the jurisdiction of such Board shall be supplied with a list of all children within his or her department or school, and shall call such list each morning on the opening of the school, and note the absentees and the reason of such absence, if any, and at the close of each term of twelve weeks shall make a full report to the Board of Education or of District Trustees, of all cases of absence, with the names both of children and parents, guardians or other persons having such children in charge, and said Board shall thereupon forthwith proceed to prosecute such parents, guardians, or other persons, according to the provisions of this Act.

SECTION 6. And, whereas, the State has provided an institution for the gratuitous instruction of all resident deaf and dumb or blind children between the ages of six and twenty-one years, every parent or guardian of any child or children afflicted with deafness or blindness, shall be required under the penalties hereinbefore specified to send such child or children to said institution for a period of not less than five years, unless such child or children shall have been excused by the authorities, and on the grounds specified in section one of this Act

SECTION 7. Any Justice of the Peace of the proper city, or city and county, or school district, shall have jurisdiction of all offenses committed under the provisions of this Act.

SECTION 8. This Act shall be in force and effect from and after the first day of July, eighteen hundred and seventy-four.

[This Act was introduced by Hon. S. J. Finney, Joint Senator from San Mateo and San Francisco Counties. We herewith give his remarks in support of the Act.]

MR. PRESIDENT—I invite the attention of the Senate to the provisions of this Bill. *Section one* simply requires that parents, guardians, etc., shall educate their children *somehow* and *somewhere*. It does not dictate where or how; either in public or private schools, or at home—but in one of these places the child must be educated. It does not take a child from home to educate it. The Bill allows of reasonable excuses, such as bodily or mental weakness, sickness of children or of parents, or even parental poverty, or even the distance of one rod more than one mile from the home of the child, or in case there be no school for three months within that distance. It goes further—its provisions apply only to cities, incorporated towns and villages, and school districts having one hundred children. **Section two* simply provides for pub-

* The Act, as enrolled and approved, applies to all school districts of the State, irrespective of the number of census children in such districts.—ED. TEACHER.

lication of notices of this law, so that all may know what is required. *Section three* makes a violation of the Act a misdemeanor, triable properly, and on conviction punishable by a fine not to exceed $50.00—it may be but $10.00. *Section four* provides for the mode of prosecution and the disposition of the fine, method of paying the costs thereof—the mere process of carrying out the law. And *Section five*, for census marshals taking a list of all children liable to the provisions of this Act; and for the teachers to call the roll of such children in a certain way, to note the absentees, and make a report of such absentees to the proper Board of Education, or of Trustees. *Section six* provides that all resident deaf and dumb shall be sent to the State institution provided for their gratuitous instruction for consecutive years—between six and twenty-one years, unless excused by the proper authorities. *Section seven* provides for a truant officer in cities of twenty thousand people, and for boards of inspectors for each city or town.

MR. PRESIDENT, the objection to the Bill must be to its principle, or to its policy, not to its structure. Accept the principle and policy of compulsory education, and you can scarcely conceive a milder form of putting it in force—of executing it.

But here we are met with the general proposition that, as a general rule, the business of life is better performed by those who have an immediate interest in it, and are left to take their own course, uncontrolled either by mandate or law, or by the meddling of any public functionary. And this is true, as a general rule. But the answer to this, so far as the education of children is concerned, is this: The persons most interested immediately, whose interests are most directly involved—viz: children—are not the best judges of the matter, nor, in fact, competent judges at all. What kind of judge of the necessity, extent and quality of the knowledge requisite to enable him to succeed in life is a child of five or eight years of age? To say the parent can judge for it is to place the interests of one class in the hands of another, which is a violation of the very proposition which is instituted to defeat the compulsory principle itself, and is to assume that no parents will or can be ignorant, indifferent or willfully neglectful of the interest of their children—three false assumptions in a single breath. Facts show that parents are indifferent, neglectful, or even willfully negligent of the educational interests of childhood. Sir, the question is, shall one class have power to defeat the intellectual interests of another and weaker class? That is the question. The words of Mr. Mill on this great question cannot be improved. "There are certain primary elements and means of knowledge, which it is in the highest degree desirable that all human beings born into the community should acquire during childhood. If their parents, or those on whom they depend, have the power of obtaining for them this instruction, and fail to do it, they commit a double breach of duty: towards the children themselves, and towards the members of the community generally, who are all liable to suffer seriously from the consequences and want of education in their fellow citizens. It is therefore an allowable exercise of the powers of government, to impose on parents the legal obligation of giving elementary instruction to children." Again, "education is therefore one of those things which it is admissible in principle a government should provide for the people." And again, we only need to reflect, that the uncultivated cannot be competent judges of cultivation; those who most need to be made wiser and better, usually desire it least, and if they desired it, would be incapable of finding the way to it by their own lights. Persons who do not desire education for themselves, will have little desire or it for their children, and will not provide the means for its attainment for others. If people were left to tax themselves personally for education, the public schools would die in a very short time. The poor would refuse to tax themselves because of their poverty, would point to the rich to perform this duty; and the rich would refuse to tax themselves to educate any children but their own; and between the two, education would never be accomplished. The proposition involved in the objection to compulsory education, viz: that it is an infringement of personal liberty, would, if carried out, take the whole question out of the hands of the State. The objection holds equally against any tax for education at all. If the State has no right to compel education, it has no right to force out of the pockets of

the people a single dollar for public instruction. The right to tax for public instruction is as clearly a breach of the personal liberty of the citizen as the right to enforce education itself. In fact, it is a step in the same direction; it forcibly provides funds for public instruction; and this is an assumption of entire power to enforce the instruction, for which it has enforced the tax. Sir, I have studied this subject in every light of which it is susceptible of being viewed, and I know of no argument against compulsory education which can stand the test of experience or of necessity. This whole question is one involving the right of self preservation and the future prosperity of society. If ignorance would endanger the existence and prosperity of society, then the State has the right to provide against it. It is the question of the right of the corporate reason of the body politic to provide against the inroads of stark barbarism. It is the contest of light against darkness, of virtue against crime, of prosperity against pauperism. It is an effort to base the laws of the State on the moral rectitude of the universe; to reinforce the higher life of society against the regressive tendency in individual man; to substitute the voice of the whole community and the experience of the whole world for the personal caprice, or ignorance, or indifference, or neglect of individuals. It is the voice of the centuries against the caprice of the moment; it is experience against ignorance. And this is the grandest warfare of the world. And here we shall be again met by the objection that, "once allow the State to enforce education— once establish the principle and precedent that the State may compel parents to educate their children, and the danger that it may also dictate what shall constitute education itself, will arise; that it is a step toward intellectual and religious despotism under power of law, and the next step will be the establishment of a creed, and a State church." To this I answer: First—The objection, if good against a compulsory education, is equally good against a compulsory tax for education, for the principle is the same in both. And if it be sound, Senators cannot excuse themselves for voting the one, and refusing to vote the other, and we should at once divorce the State from all relation with education and remand the whole question to the individual citizen. Are those who make this objection ready to apply it impartially and honestly to the whole subject of education?

Sir, I ask again, what is there in the constitution of republican society, or in the idea of republicanism itself, which is opposed to compulsory education? We have no state church to enforce a state creed; scientific truth is becoming the creed of the world, as it is the revelation of nature herself. The world cannot retreat to the dark ages again; it must advance on the path of scientific knowledge, if it advance at all.

MR. PRESIDENT, the title to this bill should be—*An Act to prevent Parents and Guardians from defeating the Intellectual Rights of Children.* The right of a child to the power and panoply of education is as natural as constitutional, and as indefeasible as its right to food. And, if the right to protection from government of its children cannot extend to their intellectual interests then the State is powerless to protect the greatest interest of man. And the State which refuses this protection is guilty of the most monstrous and criminal neglect. If educated mind be the one great central force of civilization and social prosperity, then protection of its rights and interests is the first great duty of the State. The authority of a parent is not absolute, but is limited by the inalienable rights of childhood to life, food for body and mind, and a fair start in the race of life. The parent or guardian who attempts to defeat these rights of children is guilty of a natural felony, and should be so treated by law, for he attempts to cripple those mental energies whose generous education would make his success secure.

Sir, are the advocates of legislative educational *nihilism* thus driven to urge that the State has no right to compel parents to educate their children, on the grounds of an argument—if argument it could be called—which would deny the right, and forbid the State to punish—nay, even to "take cognizance of such a non-performance of parental duty" as would result in the starvation of children? Sir, it is a fit argument for the neglect of education by the State. It is well that those who oppose compulsory education should do so on grounds and for reasons which would deny the right of the State to "take cognizance of" the starvation of a child by its parent. The villainous argument is fit for so villainous a con-

clusion, and both argument and conclusion are false. Both are based on a mistaken and fallacious—if not positively stupid—distinction between "*active*" and "*passive*" villainy. The parent who should so omit to feed a child that it starve, is as much a murderer as if it had dashed out its brains; but it would be only "the non-performance of a parental duty." And, sir, this is the best argument yet brought forward on principle in opposition to compulsory education. And I stand here to assert that the parent has no more right to neglect to furnish instruction to the mind of the child than he has to neglect its food. The parents are the cause of, and responsible for, the child's existence. And that child is dependent on its parents and on society for both food and knowledge; and neither the parent nor the State has any right to neglect either. Food and instruction are the parallel and correlative rights of every child while in a state of dependence. Until the child can safely shift for itself, society is bound to it by the rights of citizens to its protection for both body and mind. Society has entire possession of the world into which each child is born, and is bound by this fact of possession to arrange for the life and success of every child. Society owns the lands and waters of the State; all the supplies of food, of knowledge, are in its hands, and it can no more justify its neglect of the mental than of the physical rights of childhood. It is bound to see that the rights of childhood to life, physical and mental, to liberty and the pursuit of happiness, are guaranteed and protected, alike against fatal neglect and positive aggression.

And to the consideration of the great principles underlying, and the great policy involved in the structure of this great measure, I now invite the attention of the Senate.

And First—*Has a republican State a political right to require, to enforce, the education of all the children of the people?* Second—*Is it a wise and necessary policy to enforce the education of the children of a republican people?* These, sir, are the great questions involved in the consideration of the bill now pending before the Senate.

To the first question we may reply, that unless there be some Constitutional provision in the organic Act establishing a republican State, or some logical and intrinsic prohibition against it, in republicanism itself, then such State has the right to enforce the education of the children of the people. Then we are to ask first, is there any prohibition in the Constitution of the State of California against compulsory education? And second—Is there any natural, logical and intrinsic repugnance to compulsory education in the nature of republicanism itself—that is, in the principles of republican government? In other words, is the theory of compulsory education naturally and necessarily opposed to the idea and spirit of republican society?

First, then, there is no provision in the Constitution of the State of California at all opposed to compulsory education. On the contrary, the Constitution, Article 9, Sec. 2, says: "*The Legislature shall encourage by all suitable means the promotion of scientific, intellectual, and agricultural improvement.*" Sir, the Constitution compels us to educate, to educate by "*all suitable means.*" And we have sworn to obey the Constitution. The Constitution, then, commands the Legislature to promote education; and the command itself gives full power to judge of "suitable means." The Legislature must promote scientific, intellectual and agricutural improvement, and it is sole judge of what means are suitable. Nor is this all. The clause before us commands the use not only of "suitable means," but of *all* suitable means. It does not allow any inactivity, indifference or neglect on the part of the Legislature; it requires that no suitable means shall be neglected; it commands the use of every valuable method of promoting the great interest of education. And this power and duty are commensurate. Its execution and performance require an active investigation of all the means of education known or knowable; else how can the Legislature be prepared to adopt "all suitable means?" Sir, the Constitution allows us no latitude for neglect; it excuses no ignorance on our part; it allows no prejudice, no partyism, and no choice, but commands active performance of duty. And the only limit it sets to our power over education is that of scientific, intellectual and agricultural improvement. We may not institute a creed, and command that it be taught in our public schools; no ecclesiastical establishment is embodied in

this clause. Scientific knowledge, the cultivation of the intellect, and the development of agriculture form the specific objects to be attained by us in the promotion of education in the State. We cannot go beyond this limitation without violating the Constitution. And this limitation is just, sound and wise. It has been forged in the fires of persecution for more than three thousand years, and comes down to us as the voice of the living providence of history itself. And no American can excuse the violation of this great principle. It is the security for the sacred liberty of religious faith, and rather than break down this great bulwark of religious liberty, education had better be left entirely in private hands, without any relation to the State. But, sir, it is not in any degree necessary that this principle should be endangered in the full and complete execution of the powers granted to the Legislature in this clause of the Constitution. The power given is ample, while the limitations are clear, decisive and safe. Under this clause the power of compulsory education is clearly established, only so it be kept within the range and limit of scientific, intellectual and agricultural improvement, and is evidently a "suitable means" thereto. There is, then, in the Constitution no prohibition against compulsory education. On the contrary, the clause itself is "compulsory on the Legislature." The Legislature *shall* "encourage," etc., is the word of the organic law. Again, is there any natural and necessary repugnancy in the Constitution and character of republican government to the theory of compulsory education? Is there a logical conflict between the idea of republican government and the idea of compulsory education? If there be, then, either compulsory education or republican government must be abandoned. That there is no such repugnancy is evident to any thoughtful mind. Republican government is representative government, and the people can announce their will as they do in a reprentative legislature, executive and judiciary. The one great power at the foundation of republican society is the right and power of taxation. The *people* can tax themselves to execute their own will; they can and do tax themselves for educational purposes. The power to tax for education involves and includes the power to enforce education itself. Chief Justice Marshall says: "The power of taxing the people and their property is essential to the very existence of the Government, and may be legitimately exercised on the objects to which it is applicable, limited only by the structure of the Government itself. The power over legislation, and consequently over taxation, operates on all persons and property belonging to the body politic. This is an original principle which has its foundation in society itself. It is granted by all for the benefit of all." Let Senators note the words: "And may be legitimately exercised on the objects to which it is applicable, limited only by the structure of the Government itself." Here, the object is education; hence the power to tax for education is a power which can legitimately educate. The only limit is the structure of the Government itself? Now, sir, I ask, what is there in the structure of republican government which prohibits compulsory education? There is no such limit in our Constitution, as we have seen; and such is the character of its provisions that the people themselves are left to regulate the means of education through the Legislature which represents them. It would be absurd to say the Legislature can tax personal property for education, but has no power to see that that tax shall become education itself; that it can force the means for education by the whole public power of the State, but cannot, also, enforce the education for which it can enforce the money. The greater includes the less; if the State can enforce a tax for "scientific, intellectual and agricultural improvement," it can enforce "scientific, intellectual and agricultural improvement." There is no escape from this logic.

Again: The power to enforce education is derivable from the power of public police. Cooley, in his Constitutional Limitations, says: "The power of public police, like that of taxation, pervades every department of business, and reaches to every interest and every subject of profit and enjoyment." It tends to the preservation of public order and the prevention of offenses; it establishes rules of intercourse and good manners between citizens; it aims as much to prevent as to punish crime. If it can hang for murder, it can extend to its prevention, if it be able to find the means for such prevention. If this power can protect society against cholera and small-pox, it can protect society from the ravages of that

mother of all pests—ignorance. If it can command the sewerage of a city, it can command the sewerage of society. Daniel Webster has said with great power: "The power over education is one of the powers of public police, belonging essentially to government. It is one of those powers, the exercise of which is indispensable to the preservation of society, to its integrity and its healthy action." * * "It is evident, therefore, that popular cultivation, as diffusive and general as the numbers composing the republic, is indispensable to the preservation of our republican forms; and hence arises the great constitutional duty of the Government. It is the duty of self preservation according to its actual mode of existence, for the sake of the common good."

And Mr. Macauley, in the British Parliament, declared:

"I hold that it is the right and duty of the State to provide for the education of the common people. I conceive the arguments by which this position may be proved are perfectly simple, perfectly obvious, and the most cogent possible." * * * * "Take away education, and what are your means? Military force, prisons, solitary cells, penal colonies, gibbets, and all the other apparatus of penal laws. If, then, there be an end to which government is bound to attain; if there are two ways only of attaining it; if one of these ways is by elevating the moral and intellectual character of the people, and if the other way is by inflicting pain, who can doubt which way every government ought to take? It seems to me that no proposition can be more strange than this: that the State ought to have the power to punish and is bound to punish its subjects for not knowing their duty, but at the same time is to take no step to let them know what their duty is."

But we may be met here with the doctrines of legislative nihilism of Herbert Spencer, in the matter of education. Mr. Spencer says in his Social Statics, chap. 26, page 360; "In the same way that our definition of State duty forbids the State to administer religion or charity, so likewise does it forbid the State to administer education. In as much as the taking away, by government, of more of a man's property than is needful for maintaining his rights is an infringement of his rights, and therefore a reversal of the government's function toward him; and inasmuch as the taking away of his property to educate his own or other people's children is not needful for the maintaining of his rights; the taking away of his property for such a purpose is wrong."

He further says "the rights of children are not violated by a neglect of their education." He asserts that "a parent who is *careless* of a child's education" does not diminish his liberty. "Omitting instruction in no way takes from a child's freedom to do whatever it wills in the best way it can; and this freedom is all that equity demands." He continues—"Consequently however wrong the non-performance of a parental duty may be, however much it is condemned by that secondary morality—the morality of beneficence—it does not amount to a breach of the law of equal freedom, and cannot therefore be taken cognizance of by the State."

This theory of the relation of the State was conceived in a monarchy with a State church, where the great mass of children are destitute of schools and of education; it is the rebellion of mind against State-church-craft. But Sir, if it be good for anything at all here in a republican State, it should at once remand the whole question of education to the private citizen. If this mere legislative nihilism of Spencer be right, the Constitution of our State, and of republican government itself, is wrong. The Constitution commands us to educate; it compels us to tax for education; it establishes schools, colleges and universities by a tax taken from all who have any property in the State. Mr. Spencer informs us that the "taking of a man's property for this purpose is wrong." And it is on this doctrine that the State has no right to tax the people for educational purposes, that he opposes all State education whatsoever. He asserts that protection is the only function of the State; but denies that education is protection, and endeavors to show that knowledge itself is not preventive of crime. But, Sir, I shall put against Mr. Spencer, on this question of the relation of the State to education, the voice of Jno. Stuart Mill, one of the greatest logicians of this century, and a standard writer on political economy. In his great work on political economy, volume 2, page 577, speaking of the limits and province of Government he says: "In the matter of

education the intervention of Government is justifiable, because the case is not one in which the interest and judgment of the consumer are a sufficient security for the goodness of the commodity. * * The person most interested (viz: the child) is not the best judge of the matter; not a competent judge at all. * * In the case of children and young persons, it is common to say that, though they cannot judge for themselves, they have their parents or other relatives to judge for them. But this removes the question into a different category, making it no longer a question whether the Government should interfere with individuals in the direction of their own conduct and interests, but whether it should leave absolutely in their power the conduct and interests of somebody else. Parental power is as susceptible of abuse as any other power, and is, in fact, constantly abused." This is only another way of saying children have rights and interests which society is bound to protect, and are as much subjects of just and proper legislation as the rights of adults. The great principle on which all true government rests is this: that every person has the fullest liberty to the exercise of his faculties compatible with the possession and enjoyment of the same liberty by every other man. But note, individual liberty is limited by social reciprocity; the rights of society confront the liberty of the individual, and require that his freedom shall not imperil the liberty of the whole community. Personal liberty is limited and defined by the rights of society. No individual is free to retard the advance of any other individual, nor to resist the interests of the whole body politic. Absolute personal freedom would destroy all social sovereignty, and resolve the State into anarchy again. And hence the necessity for law, for a State, for government itself.

And here, Sir, I am compelled to accuse Herbert Spencer of misrepresentation of this passage from Mill. It will be noted that Mr. Mill distinctly refers to the "child as the 'consumer;' the person most interested (the child) is not the best judge of the matter; not a competent judge at all." How does Mr. Spencer answer the argument? He confounds the "child" who is the "consumer" mentioned by Mr. Mill, with the entire adult people. He says, after quoting the passage referred to from Mill, "It is strange that so judicious a writer should feel satisfied with such a worn out an excuse. This alleged incompetency on the part of the people has been the reason assigned for all State interference whatever."

I assert that no Senator can logically oppose the idea and principle of compulsory education, and still vote a compulsory tax for education. Sir, is it the theory of "compulsion" which frightens Senators from the support of this measure? Then why did they vote a compulsory tax of a million dollars for this object? And this, sir, is a tax which falls alike on parents and bachelors, on misses and on mothers—on those who have *no* children as well as on those who have. And many taxpayers in this State who have no children are saying with emphasis that if those who have no children are forced by law to pay out their money for education, we demand that the truant children of the State must be, and of right ought to be made to receive the benefit of such education. Such people say, and have the right to say, you have no right to tax us to educate other people's children, and then neglect to educate them by leaving your schoolhouses empty. They are willing to stand the tax if the State will educate all the children in the State, but not otherwise. Sir, the State has already gone too far in the compulsory direction, or it has not gone far enough. Near fifty per cent of the children of this State are not in school, as is shown by the report of the Superintendent of Public Instruction. We therefore waste near fifty per cent of the immense sum which we raise by taxation for the education of our children. Sir, this waste of the people's money should be stopped. When we find fraud in any of the financial affairs of a public officer, the whole State cries out against him; but when a great sovereign State—without adequate thought, from sheer neglect—wastes a half a million of dollars annually on education, it seems to excite but little attention—in the Legislature. Sir, the Legislature is behind the people in this thing, for they have demanded compulsory education in the platform of at least one successful election, and our present State Superintendent holds his place on that plank, and was elected on that issue, and is the ablest one the State has ever had.

MR. PRESIDENT, why do we tax for education at all? I answer, on the ground—and this ground only—that public education is a protection to the State; on the ground that knowledge is promotive of social order, peace and prosperity. If it

can be shown that education, good as it may be, is no protection to the State, then, sir, taxation for education is a robbery, and should be abolished. Will Senators attempt this task? Will Senators show us that the highest and most complete development of all the human faculties to a harmonious and consistent whole is not promotive of public virtue, social order, peace and prosperity? Will any Senator stand up here in his place on this floor, and attempt the task of demonstrating that knowledge, culture, refinement—that is, education—is not calculated to elevate higher and higher, as itself shall rise in completeness and character, the life and character of individual and social mankind? Sir, if knowledge be no protection to the State, history is a lie and the world a failure, and the State itself should be abolished.

Having shown that the argument by which it is attempted to prove that compulsory education is repugnant to the Constitution of a republican State, and to the idea of republican society, would be equally good for abolishing all educational tax, and therefore for disconnecting the State entirely from all educational affairs, and so, for remanding the whole question of education to the private citizen; and having shown that the whole argument from Spencer is expressly aimed, intended and designed by its very terms, to destroy all relations of the State to education, to abolish all State, county and district taxes and rate bills for education; and having shown that it is republican for a republican people to tax themselves to educate their own children in a republican or representative fashion, and having shown that the Constitution of our State commands the Legislature to encourage "by all suitable means," scientific, intellectual and agricultural improvement, I now proceed to consider the second great question involved, viz: *Is it a wise and necessary policy for a republican State to enforce the education of the children of its republican people?*

Of course the people are the sovereigns of the republican State, and can do through their Legislature whatever their Constitution does not prohibit. They can even amend, or abolish their Constitution itself, and change their form of government. But the question here to-day, is compulsory education a wise policy for a republican people? Sir, this question involves the whole question of the success of republican government; of the relations of education to national, social and individual prosperity; of knowledge and character to pauperism and to crime.

To begin, then let us ask—*Is education essential to national and social prosperity?* Will any Senator risk his reputation for sanity by denying that knowledge is power—power for wealth, refinement, culture and prosperity—in any nation? The nations of nearly the whole globe assembled their representatives in Paris in 1867. And there this great truth came to light: "That the most advanced nations were those in which, for the longest time, and in the freest and most generous manner, science and art had done their work of enlightenment." The next succeeding ones not only confirmed the lesson, but added the important deduction that enlightenment and prosperity stood to each other in the relation of cause and effect. This, sir, is the voice of the civilized world; the concrete testimony of universal experience. "Knowledge is power" is a proposition not fully realized by any but profound thinkers. This old adage is the key to Mr. Buckle's great History of Civilization. He has discussed at length the relative value and influence of the intellectual and moral forces of civilization, and has shown that, to use his own language, "the changes in every civilized people are, in their aggregate, dependent solely on three things: First, on the amount of knowledge possessed by their ablest men; second, on the direction which that knowledge takes, that is to say, the sort of subjects to which it refers; thirdly, and above all, on the extent to which the knowledge is diffused, and the freedom with which it pervades all classes of society." [See vol. i, p. 162.] Thus the statistics of the Universal Exhibition at Paris in 1867 confirm the great idea of Buckle that the most prosperous nations are those which have the most knowledge most freely and generously diffused among the people, and directed to the living purposes of individual and social advancement and amelioration.

John Scott Russell says in his work on Technical Education: "It is because it is now too late to mend this generation that I entreat statesmen, men of education and refinement, and men versed in the knowledge of the civil organization of the lands—those who have not sunk patriotism in that narrow selfishness which calls itself 'personal freedom and independence'—to unite in an enduring effort to begin from this day a systematic, organized, *national* crusade against ignorance: and to resolve that the citizen of England is by race, breeding and moral character, entitled to receive and able to turn to profit as good an education as the more favored citizens of other nations."

"Twenty-five pounds sterling represents the actual cost in education of a highly skilled over a less skilled workman. In other words, the cost of producing a skilled workman is less than one year's purchase of his increased value to the nation."

Mr. Buckle asserts of Adam Smith, and his influence through his great work, entitled, "The Wealth of Nations," that "this solitary Scotchman has, by the publication of one single work, contributed more towards the happiness of man than has been effected by the united abilities of all the statesmen and legislators of whom history has preserved an authentic account." Sir, it is knowledge, and knowledge alone, which lifts the tribes of men and of savagism into civilization. It is the intellectual principle, which, gathering strength from age to age, becomes the mighty Amazon of civilization itself, bearing whole nations, empires, republics, on toward the era when cultivated reason shall become the acknowledged sovereign of human affairs. Kingdoms, theologies, religious creeds, may decay and pass away, but the discoveries of genius endure forever. The *ideas* of great men are aboriginal germs of future empire, that spring ever fresher as time rolls on. The great truths of science are never young, never old, and never decay. Opinions vary and change from age to age, but the great laws of science are the revelations of that divine procedure which moves through time like the gods of Homer through space—one step taken and ages have flashed away; but that step once taken is never retraced; onward and upward forever marches the ever expanding reason of man. Oceans, rivers, solid continents of rocks, empires of time and the ages; aye, the mighty and myriad constellations of the heavens, are the objects and implements of its pleasure and its profit. It is the intellectual principle which alone can harness the stars to human chariots, and compel the very gods to do our chores. It is this force which dragged whole generations across oceans and continents, twists whole mountains of refractory iron into engines of utility, and cuts up mountain ranges of granite into temples of art, of commerce, and of domestic life; it is this power which has seized the subtleist agency in the armory of the universe, and made it the agent of trade and of commerce, and the living bond of fraternal international empire. These are the triumphs of knowledge—of the intellectual principle. Again, Mr. Buckle has shown that the two greatest evils, I might say crimes, of the world, viz: "religious persecution and war," are being gradually and rapidly abolished, not by feelings of humanity, but by the advance of knowledge; not by new discoveries in morals, but by new discoveries in science. The great moral truths of all nations and ages are the same; even the Decalogue has been found engraved in Egyptian hieroglyphics centuries prior to the Ahrahamic era; and no new moral truth has been brought to light for ages. Buckle says: "For the deeper we penetrate into this question, the more clearly shall we see the superiority of intellectual acquisitions over moral feeling. There is no instance on record of an ignorant man, who, having good intentions, and supreme power to enforce them, has not done far more evil than good. And where the intentions have been very eager, and the power very extensive, the evil has been enormous." Buckle refers to two great instances. The two most worthy and elevated and moral emperors of Rome, were Marcus Aurelius Antonious, and Julian, two of the most kindly, unflinchingly honest, and fearless rulers, yet they both persecuted the early Christian; while the two most thoroughly depraved Roman monarchs, Elagabulas and Commodus, instituted no persecutions against them.

And the second illustration is furnished by Spain. No other nation has been so entirely under the control of the ecclesiastical orders; no other people has furnished so many zealous, self-denying missionaries for christianity; and yet no

other nation on earth has caused so much religious persecution as Spain. She invented the Inquisition, and the men who invented this engine of ruin were men of pure morality and unflinching honesty of purpose. Florento, the great enemy and historian of the Inquisition, never insinuates even a charge of insincerity against the moral character of the Inquisitors. Sir, it is not blind, religious sincerity, but cultivated reason, that can guide the march of social republican empire. Calvin was honest, but he burned Lervetas for heresy. Says Buckle: "the great antagonist of intolerance, is not humanity, but knowledge. It is to the diffusion of knowledge, and to that alone, that we owe the comparative cessation of what is unquestionably the greatest evil men have ever inflicted on their own species." And Mr. Buckle shows beyond a doubt, that, with every advance of the intellect, both persecution and war decline. No man can study with care this great historian of civilization, without coming to the conclusion that knowledge is rapidly destroying the greatest crimes of the world. The intellect alone can furnish the light to illuminate the paths of empire; without knowledge the moral feelings are blind. This moral sense can give the feeling of duty, of honesty, of responsibility; but it can throw no light on the path of social procedure. The railroad, the telegraph, and the printing press, do more to bring mankind into friendly commerce and fellowship than all the sermons of all the ecclesiastics of all nations and ages put together—and these great agents are the discoveries and inventions of the intellect, and not the products of moral feelings.

MR. PRESIDENT, if the Senate will allow me I shall quote from my own speech made on this floor two years ago on this same subject:

"Knowledge is not only power, it is also democracy. Intelligence abolishes all fictitious distinctions of rank, for it knows no aristocracy but that of thought; it recognizes no sovereignty but that of truth, justice, liberty. Universal knowledge is the only universal liberty, for nations as for individuals. Her voice is the fiat of eternal reason, and her discoveries are the announcements of immutable law. The touch of her sceptre turns rocks into palaces, minerals into utilities, and darkness into light. Science recreates the world. It tames her savage energies, and reinforces the instincts of liberty and progress with the cumulative experience of all ages. The mind which can pick the very light of the heavens—of the stars to pieces in its fingers, will not bow down before the accidents of rank or birth, but acknowledges only the fiats of eternal law. Sir, light, and light alone, is liberty. And universal education is the only means of universal light. It was the perception of the great superiority of the compulsory system of education which drew from Playfair the exclamation: 'For my own country I have no higher ambition than to get schools approaching in excellence to those of Holland.' In the competition of nations, the two factors of industry, raw material and intellect, applied to its conversion into utilities, are altering their values. The first is rapidly declining, the second quickly augmenting in value. There are instances of nations rich in the natural material resources of industry, yet poor from lack of scientific knowledge to wield them into wealth; and there are instances of nations devoid of these natural material resources, but possessed of that scientific knowledge which can turn all things to account through the skill of an educated people. Spain is an example of the first class, and Holland of the second. The first is rich in all the great material resources of wealth; her climate, the richness of her soil, the vast amount of her minerals, her geographical position, all give her infinite material fountains of prosperity. But she has no schools, hence no skilled artisans and no science. Spain committed two great crimes. By the first she banished the Jews, and by the last, in 1609, she thrust out of her dominions one million Moriscoes, Christianized Moors, her only industrial artisans, and thus deprived herself of the gathered experience of centuries. She neglected her schools until her people had sunk into intellectual torpor and industrial barbarism. And she has only begun to awake since the Paris Exposition of 1867. Under its influence she is establishing compulsory schools for her ignorant people; the reign of her darkness is now broken, and the dawn of day is now tinging her mountains with the promise of a full noon-tide sun. Holland—a mud produced country, rescued from the ocean by the hand of man, fenced around by dikes, without any mineral resources, with only a maritime position, but fired with the spirit of liberty under the lead of William the Silent—estab-

lished her schools, educated her people, and has outstripped her old mistress, Spain, and now is far in advance of most European nations in general intelligence and industrial art. These examples are sufficient, and they illustrate and enforce the great truth that the educated brain of a nation is the one great source of power and prosperity. It is brain, not mere muscle, which opens and utilizes the sources of wealth. The mind is the aboriginal power of all civilization. Spain illustrates the maxim of scripture: 'He that wandereth out of the way of understanding shall remain in the congregation of the dead.'"

With these unquestionable facts of history before them, how can Senators who are supposed to know, and who ought to know something of history, and the lessons which it can teach, assert that ignorance has not caused the wholesale crimes of the world? If nations *knew* better they would *do* better.

But all this may be admitted, and yet the necessity and policy of compulsory education be denied by Senators. I concede that a Senator can be honestly opposed to compelling the education of children, and yet believe in the policy of education in the old voluntary forms. Senators may favor education, but oppose compulsion. But not all the legislation of the world is of as much utility, as much protection to the State, as either the railroad, the printing press, or the telegraph.

But it may be said that the idea of education which I hold up is not realized in fact in any nation at large. True. But then, the little knowledge and culture the best educated do acquire *tends* to the realization of this idea. Neither nations nor individuals can mount at once to the highest summits of intellectual and moral power and perfection. But is this a reason which grave Senators would give to show that we should not take the first few faltering steps up the glowing ascent of knowledge, of culture, and of moral power? Sir, shall we be exhorted not to learn the alphabet, because we cannot at once attain to an exhaustive knowledge of all that is knowable in the Universe? Because our schools are imperfect or incomplete, shall we abolish them? Because the education they give is defective, shall we refuse to educate at all? If the incompleteness of our child has not taught it to walk, and its mother neglects to feed it, this neglect, according to Spencer, in no way "takes from the child's freedom to get that food wherever it can find it." "*The liberty to exercise the faculties is still in tact.*" The child can still take its chances, hunt up its own food, or starve. It is no answer to say, parents will not starve helpless children. The question is one of rights—the rights of childhood to knowledge. And besides, parents and guardians do sometimes starve not only their children but themselves for rum. Sir, it is the question of food for mind as for body that is here involved. Suppose the child is three years old and its parent neglects to furnish it with food? Mr. Spencer's theory is still applicable; it can still be said: "The parent who is careless of a child's" food "does not infringe the liberty of the child to exercise his faculties in getting it the best way he can." Spencer continues: "Every aggression, be it remembered, every infraction of rights is necessarily *active;* whilst every neglect, carelessness, omission, is necessarily passive. Consequently, however wrong the non-performance of a parental duty may be * * * it does not amount to a breach of the law of equal freedom, and cannot, therefore, be taken cognizance of by the State." [See Social Stat., p. 361.]

Sir, can logical stupidity go further? Has the State, then, no right to require a parent not to so neglect his child as that it shall starve? Can't a parent or guardian starve a child by "the non-performance of parental duty?" A mother can starve a child without a single "aggressive" act; she can refuse it the milk of her breast, of the bottle and other food by simple "neglect," "by the non-performance of a parental duty." And yet if she does so the State can take no cognizance of the deed, because it "does not violate the law of equal freedom." "The liberty to exercise the faculties is still left in tact." The omission of food "in no way takes from a child's freedom to do whatsoever it wills, in the best way it can." Sir, *this* "*in the best way it can,*" of Spencer, is in no way whatever to any purpose of self-preservation of the child. The child cannot preserve itself against fatal neglect, therefore the State should.

But time will not allow me, Sir, to pursue this criticism of Spencer's legislative nihilism further. I turn to educational statistics for instruction as to the wisdom

and necessity of compulsory education. I refer the Senate to the following statement of the United States Commissioner of Education for 1872. He makes the following exhibit in carefully prepared form of the educational statistics of the Republic. He says:

"Who can speak boastingly of American intelligence, with a knowledge of the fact *that over 17 per cent. of the adult males of the country, who are essentially all voters, are illiterate, and that nearly one fourth of the adult females (over 23 per cent.) are in the same condition?* But the amount of intelligence in the country, as tested by the capacity to read and write, is not limited to these adults. The census gives those who can not write, 10 years old and over; and those from 10 to 20 certainly should not be excluded in an effort to estimate accurately the intellectual power of a people. Even those from 5 to 9, inclusive, though not a great direct power in this particular, yet, as being able to read, may be a medium of information to parents and other adults around them, and we may, therefore, include them in the reckoning. The census does not give those under ten who can not write or cannot read; but we may make an estimate on the basis that the same percentage holds good as in the case of those over 10. With these considerations for our guidance, we have, from the figures, the following results:

Total population of all ages	38,558,371
Number under 5 years old	5,514,713
Number 5 years old and over	33,043,658
Number 10 years old and over	28,228,945
Number 5–9 years old inclusive	4,814,713
Number of illiterates 10 years old and over	5,658,144
Estimated number (20 per cent.), 5–9 years old, inclusive, illiterate	962,942
Estimated number, 5 years old and over, illiterate	6,621,086
So that the number 5 years old and over, not illiterate, is	26,422,572
Per cent. of illiterates 5 years old and over to population of the same ages	20.04
Per cent. of non-illiterates 5 years old and over to population of same ages	79.96
Per cent. of illiterates 5 years old and over to population of all ages	17.17
Per cent. of non-illiterates 5 years old and over to population of all ages	68.53
Per cent. of population under five years to population of all ages	14.30

From these figures it will be seen that out of the 38,558,371 of the population of the United States of all ages, 12,135,799, or 31.47 per cent. of the total population, must be excluded from any estimate which would ascertain the number who are able, through reading and writing, to exchange information with others for the guidance of their conduct. How many of the remaining 68.53 per cent. of our entire population who can read and write have any instruction in reckoning, or know anything of the grammar of our language, or the history or geography of our country, or how many have completed the course in our high schools and academies, or how many have received a collegiate or professional education, we can not tell as yet."

Seventeen per cent. of adult males, and twenty-three per cent. of adult females, illiterate! Sir, it is awful to contemplate.

Now if we examine the school statistics of our own State we shall find no cause for self-gratulation. I find from the report of our able State Superintendent of Public Instruction that 40 90 per cent. of the children of school age are truant and utterly non-attendant together. 41 per cent. of the children in the State of California, not in school, not being educated. "We also find that the evils of truancy have increased 7.35 per cent. It also appears that out of 97,681 listed as having attended public schools at any time during the School year, only 71,170 of these have attended long enough and regularly enough, to be entitled to be considered as pupils of the public schools. That even among this number a large percentage was irregular in attendance, is proved by the fact that the average daily attendance was only 63,063, 88,60 per cent. on the average number belonging, or 44.53 per cent. on the total number of census children, so that in fact at least 50 per

cent. of our children are practically out of school." And the Superintendent finds but two remedies; first, a more generous endowment of the public schools, and, second, compulsory attendance thereon. Chancellor Kent says: "A parent who sends his son into the world uneducated, and without skill in any art or science, does a great *injury to mankind* as well as his own family, for he defrauds the community of a useful citizen and *bequeaths to it a nuisance*." And I add, the State has the unquestioned right to abate a nuisance. And here before us lies the fact, that in the nation at large more than 31 per cent., near one third of the whole 38,558,371 of our population, "are unable through reading and writing to exchange any information with each other," while one half of the children in our own State are growing up into adult illiteracy. And if we inquire for the cause, it is found in the indifference, neglect or willful conduct of parents and guardians. And this can be remedied only by compulsory education. Michigan passed a mild compulsory law two years ago, and the State Superintendent writes me, that though the law has not been enforced in the courts, the attendance on public schools has increased over four per cent. in the last year. Such is the direct moral of a compulsory law. But Sir, if the law should be enforced, it is safe to predict, that in two years, all the children of the State, not excused for cause by the Boards of Trustees, will be practically in school in Michigan.

And, Sir, Connecticut has had a compulsory school law too, for two hundred and twenty-four years, or since 1650; but it was defective in that it allowed the children of poor to be excused from attendance. And Mr. B. G. Northup, Sec'y of the Board of Education of Conn., went to Europe to study the various systems of education in operation there, and he tells us that, though when he left Connecticut he was opposed to compulsory education, when he returned he was strongly in favor of it; and under his influence, Connecticut has since adopted a more stringent compulsory law. New Hampshire, Massachusetts, Connecticut, Michigan and Maryland have now compulsory school laws; even England has such a law, while Prussia, Holland, Austria Russia, Egypt, the Ottoman Empire, the Sandwich Islands, and last and best of all, Spain, the long silent land, the once leading nation of the ancient world, sunk almost into hopeless decrepitude, has arisen and established compulsory schools. Sir, the entire civilized world is awaking to this great necessity of educating every child in the State. The awakening cry of nations is for *light*—more light still.

MR. PRESIDENT, let us reflect on the intellectual and moral condition of the world. Now no intelligent man disputes that Prussia has become the leading nation of Europe, because her people are more thoroughly and nearly educated than any other continental nation. Austria admits, through its authorized Minister of Instruction, that not the needle gun, but the educated soldiery which invented and stood behind it, was conqueror at Sadowa; and France admits, through its leaders that she was beaten in the late war by the common schools of Prussia; and Jules Simon drew up a compulsory school law for France. All the great English political economists admit that England is fast loosing her ancient mechanical and manufacturing ascendancy, in consequence of the better education of the mechanics and people of the great German Empire; while it is now admitted by all the best informed men of every nation that ignorance and crime are twins—nay more—are cause and effect.

If the Senate will bear with me for a moment, I will boil down the statistical evidence that ignorance causes crime, and so can be cured, or at least be reduced to its lowest terms. Let Senators listen to the voices of statistics, gathered during the last three or four years, relative to the relations of ignorance to crime. They have been carefully compiled from the tables of the census, aided by those gathered since by the National Bureau of Education. The following are found in the report of the National Commissioner of Education, page 593:

THE PROPORTION OF CRIMINALS TO THE ILLITERATE POPULATION IN REGARD TO EDUCATION.

"Here we come to test facts in regard to the influence of ignorance in producing crime. If the proportion of ignorant criminals to the whole number should prove greatly above that of the illiterate to the whole population, it will be a fact con-

clusive that ignorance is one great cause of crime. Fortunately, the returns of education and illiteracy embodied in the census of eighteen hundred and seventy, will enable us to examine this question and obtain reliable results.

"Taking the returns of the census of eighteen hundred and seventy in connection with the tables we have above given, we have the proportions below, premising, however, that, as all prisoners are above ten years of ages, so we have taken from the "illiterate" in the census only those above ten years of age.

Illiterate Criminals.

In New York and Pennsylvania	4	per cent to 33 per cent.
In Central West	3½	per cent to 46 per cent.
In West and Pacific	3	per cent to 31 per cent.
In the South	22	per cent to 60 per cent.

"It appears, therefore, that in the Middle States the proportion of illiterate criminals is eightfold the proportion of illiterate people; in the Central West it is thirteenfold, and in the West and Pacific States it is tenfold. In the South it is only *threefold;* but this is caused by the great mass of colored people, who make up a large portion of the whole people, and, being nine tenths of them wholly ignorant, furnish the great mass of criminals. When the still larger white population is counted in it makes the disproportion of the illiterate criminals less. As to colored people only it is very great. But we see in the above proportions the great fact that ignorance is one of the great causes of crime. We do not seek to exaggerate that fact. The figures we give show it in its naked deformity, and we leave the fact to the contemplation of our readers. But in the meantime, let us look at how this fact will operate in an intelligent American community. Let us see exactly how it will operate in New York or Pennsylvania. Let us take ten thousand people as the unit of measure. The result will be, according to the above proportions:

People	10,000
Illiterate	400
Estimated prisoners	40
Prisoners illiterate	35
Others	5

The "others" means only a very common education. What, then, is the practical result? That because four hundred persons out of ten thousand have been kept *totally* ignorant, the county or municipality has seven times as many criminals as it need have, and seven times as much expense and evil of all kinds resulting from it."

The report continues: "It is, therefore, a matter of primary importance in the prevention of crime and the improvement of society, as well as the avoiding of that combat between crime and law which, in this country, has been the bane of our prosperity."

"We need not cite any further testimony of this kind; this is, in substance, the testimony of all the keepers and officers of penitentiaries, prisons, jails, and reformatories in the country. It is the testimony of human experience on one of the most important points which concern human society. The evidence upon the intimate relation of crime and ignorance is clear, complete and ample. It may be comprised in two general propositions:

"First—That one third of all criminals are totally uneducated, and that four fifths are practically uneducated.

"Secondly—That the proportion of criminals from the illiterate classes is at least tenfold as great as the proportion from those having some education.

"If these proportions are true (and we have made rather an underestimate), then, after making due allowance for crimes committed from passion, without regard to education, and crimes, such as forgery, frauds, etc., which require some education, we must come to the conclusion that two thirds of crimes might be avoided by education, but more especially by religious training. Against this fact some one will reply that so also a large number of criminals are intemperate, and, therefore, we may attribute to intemperance a large number of the crimes we now

attribute to ignorance. True, if these were parallel causes, but they are not. In the first place, a large number of the intemperate are such from want of education."

I also refer to the report of the New York City Council of Political Reform, published in December, 1873, which lies before me:

"In France, from 1867 to 1869, one half the inhabitants could neither read nor write; and this one half furnished 95 per cent. of the persons arrested for crime, and 87 per cent. of those convicted. In other words, an ignorant person, on the average, committed seven times as much crime as one not ignorant did."

In the six New England States of our own country only seven per cent. of the inhabitants, above the age of 10 years, can neither read nor write; yet 80 per cent. of the crime in those States are committed by this small minority; in other words, a person there without education commits fifty-three times as many crimes as one with education.

In New York and Pennsylvania an ignorant person commits on the average seven times as many crimes as one who can read and write commits, and in the whole United States together the illiterate person commits ten times the number of crimes that the educated one does.

Sir, it thus appears that the better educated a people are, the smaller the percentage of the uneducated to the whole population, the greater the percentage of crime which the uneducated will commit. This is what we should expect, if we assume that ignorance occasions crime. For the greater the percentage of the educated to the uneducated, the higher and more complete will be the education of the best educated; and hence, the higher and more complete the standard of intellectual and moral excellence which will prevail in such a community, and the more thoroughly will this high standard be diffused among the less educated, so that the most poorly educated will receive the benefit of this higher class.

Take the proportion of illiterate criminals to the illiterate population in the Middle, in the Central West, in the West and Pacific, and in the Southern States —as given before—and compare them. In the first, it is eight fold; in the Central West, it is thirteen fold; in the West Pacific, it is ten fold, and in the South, it is only three fold. Sir, there is infinite meaning in these figures and proportions. The people of the West and Pacific come from older society, and have intelligence and ambition enough to push into new fields, and are, on the average, better educated than the mass of the people of the Middle States. Hence, the proportion is ten fold to eight fold as compared with the Middle States. But compare the proportions in the Central West, where we have the best system of public schools in the divisions named, with those of the South where no common schools were known before the war, and it is thirteen fold in the Central West, against *three fold* in the South.

Why this disparity in the ratios? Because, as I have shown, as education becomes more and more general, the greater the relative amount of crime which will be committed by the ignorant; and in the most ignorant communities this percentage will lessen until in the utterly uneducated community it would utterly disappear.

Sir, these facts and figures contain the complete demonstration that ignorance causes crime; else why is there so great a disparity between the amount of crime committed by the uneducated as against that committed by the educated? New England contains the best educated community on earth, and here the percentage of crime committed by the ignorant is the greatest on earth. Sir, these facts are startlingly significant. They tell the story of the origin and occasion of crime; *they demonstrate that ignorance is the great cause of crime.* If ignorance is not a cause of crime, we ought to find no such disparity in different communities between the ratios of illiterate criminals to the illiterate populations of those communities, as we now find; for if ignorance be no cause of crime, then these ratios could not rise and fall with the rise and fall of the ratios of the educated to the illiterate classes. If other forces produced crime, then these other causes would break up these ratios, and all our efforts to connect crime with ignorance would fail, and vitiate our inferences at every new comparison. And I now predict that within ten years no intelligent man can be found to dispute this

law of affinity between ignorance and crime. Sir, I am now astonished that any Senator can be found who now denies that mental and moral darkness is the great aboriginal den and fountain of vice, of sin and of crime. Take Massachusetts as an example of the sources of the illiterate population now in the United States, Massachusetts has of illiterate, ten years old and over, 97,742, in a population of 1,457,351, of whom 89,830 were foreign born. Out of 353,319, of the whole foreign born, 216,120 were from Ireland, and a large percentage of the illiterate children under ten, not in school, were the children of the foreign-born population. From all that can be gathered from these statistics, it is evident that not more than *one half of one per cent.* of the genuine native American population, over ten years of age, in Massachusetts are illiterate. About one tenth of the whole illiterate population of Massachusetts is native and to the manner born; nine tenths are from the Old World.

In New York in a population of 4,382,759, 1,138,353, were foreign born; or, more than one fourth are foreign born—about the same ratio of foreign born to native population as in Massachusetts. Yet this foreign born population in New York furnish less than three times the amount of illiteracy furnished by the native population, while in Massachusetts it furnishes near ten times this amount. Now, why is this? I answer—because in Massachusettts only one half of one per cent. of the native population are illiterate, while in New York more than 35 per cent. of the native population are illiterate. New York has six times the native illiteracy of Massachusetts, and hence the ratio of foreign to native illiteracy is reduced in the same percentage.

MR. PRESIDENT, let us more fully consider this great problem. New York had of imprisoned criminals in June 1, 1870, 4,704; Massachusetts had at the same date only 2.526. With three times the population, New York has only about twice the *convicted* criminals. How is this, Sir? And I answer—first, the State of New York has 47,000 square miles of land, Massachusetts has only 7,800 square miles; less than one sixth of the territory of New York. Now, Sir, the police system of the State of Massachusetts is the most complete system on this continent, while that of New York is confessedly incomplete—and taking the city of New York as a type of it, the most faulty in execution. A far greater percentage of actual criminals are caught and convicted in Massachusetts than in any other State of the Union; and this would account for a great share of the lacking percentage of convictions in New York as compared with Massachusetts. And beside the people of Massachusetts are crowded together in less than one sixth of the area of New York, and consequently the criminal classes are more completely under the surveillance of the better police regulations of Massachusetts. And beside, in New York there is a far greater agricultural population, among whom crime seldom occurs; and, if it occurs, can be less easily detected and the criminal caught and convicted. With only three times the population, New York has near six times the number of persons engaged in agriculture. Putting all these facts together, it is very evident, that while the proportion of criminals actually convicted in New York is not six times as great as in Massachusetts, still the amount of crime actually committed *is* six times as great. And then, Sir, there is this further consideration, that while ignorance in general terms is the great ultimate cause of crime, yet men of some knowledge may often, and do commit crime, not as a direct consequence of their own knowledge, but as the indirect consequence of those inferior social conditions around him, which were produced by the large amount of social ignorance with which he comes in contact, and which constitute the general social opportunity, and furnishes the special occasion of his crime. Ignorance, weakness of mind and morals in the mass, furnish great opportunities, and provide the special temptations to partially educated persons of a low, cunning intellectuality, to deceive and defraud the illiterate. For instance, to illustrate how ignorance will tempt to, and occasion crime I will relate a case which occurred in this State, and related to me by a Senator on this floor. An illiterate miner became the creditor of a literate scamp. The miner called on his debtor for some money; the creditor paid him some, and drew a receipt in full for all he owed the illiterate creditor, telling him it was a receipt for the amount paid only; the creditor signed his mark; but soon learned that his debtor had deceived him, and had a receipt in full. This so enraged the illiter-

ate creditor that he killed the false and deceitful debtor. Here were two crimes in consequence of one man's ignorance—first a swindle; and second, a murder. Had the creditor been able to read and write merely, neither of these crimes would have been committed; for the ignorance of the one furnished the occasion for the fraud of the other; and this fraud re-acting on that ignorance again, excited the deed of blood. Sir, ignorance furnishes the occasion and opportunity for crime. And where the ignorance is not in the criminal himself, it is often in the victim, and offers the very temptation of weakness, and the special occasion of the crime. Most of the crimes of literate criminals are of a financial character, such as forgery, fraud, swindling, peculation in office; and where it is not, the criminal cannot be assumed to be fully educated. A completely educated man would be incapable of crime; and a completely educated community would furnish no occasion of moral weakness, of ignorance, or of character for its commission. *Character*, as well as intellect, is educable. Reading and writing, though they are shown to be preventive of crime, constitute a mere moiety of that education which illuminates the head, expands the heart, develops and harmonizes all the faculties of man to a complete and consistent whole, such that the same divine energy seems to thrill through every faculty, unfolding a character without contradiction, anomaly or eccentricity, where the activity of no single power mars the harmony nor deranges the balance and majesty of the whole. Sir, William Von Humboldt says, "the chief Eden of man," that destiny which is decreed as possible by the eternal reason, "is the highest and most harmonious development of all the powers of man to a complete and consistent whole."

A completely educated human being would be incapable of any crime, for complete education is complete development and harmonization of all the faculties—physical, intellectual and moral. Crime is the product of unbalance of faculties, of anomalies in the character. Education, in its fullness and designed perfection, eliminates these eccentricities, brings up the lacking forces of intellectual and moral beings, and so steadies the action and career of the entire man. A man all intellect and no heart would be a Miltonian devil; a man all heart and no intellect would be a sympathetic idiot, while a man all muscle and no mind would be a brute. It is the proper balance of these three great general powers which give us the true and divine type of man. No man is this when born; its attainment is therefore a matter of education, of development. Man is a possible angel of power, of affection and of intellect combined. The complete development of these possibilities is the work of education; and to a character thus educated, crime would be simply impossible. And in a society composed of such character, the occasion for crime would not exist. But here we are again met with the objection set going and stated in its strongest form by Herbert Spencer that "ignorance and crime are not cause and effect; they are coincident results of the same cause. To be wholly untaught is to have moved amongst those whose incentives to wrong doing are strongest; to be partially taught is to have been one of a class subject to less urgent temptations; to be well taught is to have lived almost beyond the reach of the usual motives for transgression." He continues: "Ignorance, therefore, simply indicates the presence of crime-producing influences, and can no more be called the cause of crime than the falling of a barometer can be called the cause of rain." Now, Sir, let us examine this statement closely. Mr. Spencer asserts "that to be wholly untaught is to have moved amongst those whose incentives to wrong doing are strongest," and he then grades down the incentives to wrong doing as society rises in culture, and in an inverse ratio thereto. How is it that if ignorance be not a cause or occasion of crime it is found to be in the inverse ratio of culture? What are incentives to crime? They are two-fold—external, the surrounding circumstances; and the internal tendency of the individual constitution. Now, how is it that to be wholly untaught is to move amongst those whose incentives to crime are strongest? Spencer himself explains the cause a little further on. On page 384 of Social Statics, he says: "Crime is the continued breaking out of the old unadapted nature—the index of a character unfitted to its conditions—and only as fast as the unfitness diminishes can crime diminish." Sir, here is the vital want of all logic in Spencer's views brought to light. What can he mean by the "*old unadapted nature, continually breaking out?*" If there be any meaning at

all in it, it is simply this: that the untutored, that is the untamed, that is the savage nature of the man causes crime. "Old nature!" "unadjusted nature!" Sir, one uneducated man at forty-four is just as old as an educated man at forty-four; unless you give to the *knowledge* and *culture* of the latter the force, value, and virtue which the other does not possess. Is education, then, the power which adds the force and virtue of additional years to the cultivated man as against the wholly "untaught?" Spencer admits as much, and in admitting this destroys the force of his assertion "that want of education is not a cause of crime." Nothing but education, drill, experience—for these are synonymous terms—can subdue, tame, and adapt the "old unadapted nature" to its surrounding conditions. It matters not how the adaptation comes; it can come only by the force of that educative process which is slowly civilizing us. Mr. Spencer himself says: "Crime is incurable, save by that gradual process of adaptation to the social State which humanity is undergoing. Reforming men's conduct without reforming their natures is impossible, and to expect that their natures may be reformed otherwise than by the forces which are slowly civilizing us is visionary." All this is true, but I submit that Mr. Spencer here destroys his own theory, viz: that want of education is not a cause of crime. What forces are they which are slowly civilizing us? Sir, science, discovery, labor-saving inventions, the diffusion of knowledge among the masses—these are the great agencies which are just now *rapidly* civilizing us. Sir, it is education, and education alone, which has lifted the civilized nations of the world up to their present levels. Education is a mighty word; the ages have been the school of the human race, and Divine Providence in history the great educator. Only education can "reform men's nature," can fit man for the highest social state; and, therefore, every moiety of power which a State can add to this great agent of civilization is so much time gained in the advance of society to the highest possible State. Spencer tell us that want of adaptation to the social state causes crime. I ask, can an idiot adapt himself to the social state? Who can best adapt himself to the social state? None but a fool can deny that the best educated—that is the person with the highest and most harmonious development of all his powers to a complete and consistent whole—can most readily adapt himself to the highest social State. And this is the true idea of education. The schools do not educate us fully, it is true; our system of education is still low, imperfect; but what little education we get there adds to our power to become educated in the work of life, and so becomes a cumulative power for future advancement. How can a man ignorant of his written mother tongue be expected "to adapt" himself to the highest circles of a society teeming with books, works of art, science, philosophy, and religion, while he cannot read a word of the great testament of human experience in which it is all embodied? Sir, science is to-day revolutionizing all the arts, industries, and commerce of the world; how can an utterly "untaught" man adapt himself to a society in which this revolution is taking place? Can Mr. Spencer show how stark, blank ignorance can "fit itself into modern society?" Spencer says crime is "the index of a character unfitted to its conditions, and only as fast as the unfitness diminishes can crime diminish." *True; most true!* But how can a totally uneducated man, who is unable to read his mother tongue, ever come to know what are those conditions of unfitness which make him inadapted to society? Sir, the very process of education is in itself a process of adaptation to the most advanced social conditions, and none but a fool can deny it.

On Spencer's own theory then, ignorance is at the bottom of that "*old unadapted nature*" which he assumes to be the cause of crime. Sir, Spencer has deceived himself with words. "Crime is the continual breaking out of the old unadapted nature," is it? Well, "old unadapted nature" here stands for "barbarism," for "savagism." And this means simply *uncivilized*, that is, *uneducated*. No thoughtful man can make anything else out of it. It is another method of saying that an uneducated criminal in modern society is a savage. In

other words, education alone can civilize races and individuals. Mr. Spencer has been deceived by his own literary jugglery. It may take centuries to civilize a savage race, but if it be done, when it is done, it will be done by the process of education alone. We may not be able to take the child of the lowest savages on earth, and by sending him to an ordinary common school for three months a year for six or eight years, transform him into a Plato or an Emerson, but we will have lifted his mind out of the utter aboriginal darkness a little; and if we should take him early enough and school him for twenty-five years, we would nearly transform him into a civilized man; then take his child and educate it, and so on for three or four generations, we would find that the savagism of the progenitor had disappeared. The Seneca Indians of New York furnish an example. I know of highly cultivated and wealthy men and women among these people.

It is said: "compulsory education is an innovation!" *Innovation?* Yes. So was Christianity an innovation on Judaism. The philosophy of Plato, of Socrates, of Aristotle, were innovations; the discoveries of Galileo, Kepler, Isaac Newton, Descartes, Bacon, Goethe, Tyndall, innovations. Every new discovery, even in science is an innovation; the invention of the printing press, of the steam engine, of the telegraph, are innovations; Jesus himself was the greatest of innovations. Creation was an innovation, and every new rain-drop that falls, every newly opened bud or flower that blooms, every renovation of nature is an innovation. All advance of nature or of mankind is an innovation. God himself is the Infinite Innovation.

MR. PRESIDENT, it was Plato who said: "In the world there is nothing great but man; in man there is nothing great but mind." The mind of man is the motive power of civilization, as the mind of God is that of creation. Man is man by virtue of his educable reason; his mind is a microcosm, in whose spiritual deeps are mirrored the image and semblance of infinite perfections. The mightiest word in all the Scriptures of Pagan, Jew or Christian, is this: Man is the image of God; the great first principle of philosophy is the mind which philosophizes; and the grandest problem of science is the solution of the nature, powers, and destiny of that subtle mystery, that indwelling soul, that all interpretative reason which essays the task of expounding the entire constitution and course of things. The greatest poets of the world, Shakespeare, Goethe, Homer, have sung but broken snatches of the epic of the possible grandeurs and triumphs of the human reason; the greatest heroisms of the greatest conquerors are but shrunken glories of its divine possibilities in loftier and bloodless fields of intellectual and moral empire; while its victories in science are but the gray of morning dawn compared with the noontide blaze of full blown day, when the snatched glory of shrunken firmaments shall flash from his deathless brow. Around the problem of human destiny, all the agencies of science, philosophy and religion are gathering; to further his successful march through time, the vast empires of earth, ocean and the infinite deeps of celestial space and systems are ransacked and made contributory; while from the correlations of the rotary motions of the infusoria in a drop of water to the revolutions of suns and systems, man learns the laws of order, of progress, of education.

Sir, the world was made as a home and school for man; man was made to develop mind; mind was made to become the conscious embodiment of the Divine perfections. Hence the education of the human mind is the aboriginal aim and purpose of creation. Man is the crown and coronation of nature, the epitome of her forces and laws, the darling of the universe, the prince-royal in the family of God, the heir apparent to the throne and empire of science, philosophy, and religion. Governments are made for man, not man for governments; the hat for the head, not the head for the hat; and the one central question which we are entitled to ask of every Legislature is, *What can you do for mankind?* What can you do to educate, to make full and *round* with power this all-aspiring reason in man? The age of the brute is passing away; the age of the mind and the heart is coming in. The true conception of civilization is that of a condition of society in which the relations of man to nature, and of man to his fellow man, and of the entire drift and spirit of social life, shall be only contributory to the highest interests of the human race. The idea of the highest civilization is this —that educated reason, soul, shall have the same imperial sovereignty in society, that the reason of Deity exercises in the vast empires of outlying immensity.

Sir, *universal education*—how to accomplish that soonest, and with the least expenditure of time, money, and labor, is the one universal question of this century. England, France, Austria, Russia, Spain, Prussia, Egypt, the Ottoman Empire, and even the Sandwich Islands, are already ranked in order, and on the march with new and *compulsory* systems of education, while the States of our own great Republic are, just at this moment, reconstructing their systems of common schools. The idea that education is the one great primary want and supreme good to which all are entitled, is taking hold of the entire world. Popular universal education is the watchword of modern society. It is the cry of the toiling, neglected people, which comes up unto us "for light—more light still." For ages those who did the work of the world were naught but hewers of wood and drawers of water; kingcraft and priestcraft held the souls of nations in chains; the common schools of our blessed Republic broke that despotism in the new world, and its star of empire rising above the mountains of monarchy, and shooting its rays across the ocean, broke also in Europe the dominion of ignorance over the neglected masses there. The common school is an American institution; and compulsory education, though conceived by Plato, was first put in operation in 1650, in the State of Connecticut, the land of wooden nutmegs, but not of wooden heads. Sir, the cry of the world's long neglected masses for light, for liberty of soul, which comes therefrom, is rising on the wings of the morning; ere long it will descend into a shout, which no society can withstand. It is the solemn hour of the advent of the people that is upon us. Let Senators heed the cry. There are great historic moments in the life of the human race, in which the tides of the waters of Life rise to high water mark, moments in which whole nations advance centuries in a single decade; memorable hours in which, as by a great inspiration, a voice from the heart of things is heard, a fresh revelation from the soul of the world to the torpid, frivolous children of men, announcing again, as from the shuddering summits of Sinai, that hypocrisy and speciosity will be no longer taken for real performance of duty in this universe; that if the world does not mean to go utterly bankrupt, and become altogether a swindler world, and to be turned out into the cesspools of nature, sold out at auction altogether to the mud gods, it must awake from its ape condition, cease its lying and hypocrisies, and mend its degenerate manners before high Heaven. And such an hour is upon us. The birth day of the Republic was one of these memorable moments; the next was the emancipation of 4,000,000 slaves, and the regeneration of the Republic—an hour whose golden tide is still rising upon us; and pray Heaven it may not pass until it shall have made the education of every child in the land secure and certain.

The problem is, *Universal Education*—how to accomplish it.

What do we mean by *education?* A little reading, writing, grammar and geography? This is well so far as it goes; but knowledge, be it more or less, is not education, it is only instruction. Education is defined by William Von Humboldt to be, "*the highest and most harmonious development of all the powers of man to a complete and consistent whole.*" Instruction is incidental to this process of education—to enlarge and harmonize the faculties of man, to develop, to add power, precision of faculty, accuracy of hand, eye, brain and heart—this is education. To give all the children of the Republic an equal chance in the start of the work of life—to open all pathways equally to all the youth of the land; and to pour on the opening soul of the rising generation the gathered experience, the accumulated knowledge and the emancipating power of science—this is the greatest work of the age. How to accomplish this in the most speedy and economical manner is the problem we are set to solve.

And I think I have shown there is but one way to do it—and this is to require of all parents, guardians, and other persons holding the destinies of childhood in their hands, to furnish them with such primary education as shall train their opening powers to meet and master the obstructions of life, and open to their feet the only true highway and pathway to universal light, liberty and love.

DEPARTMENT OF PUBLIC INSTRUCTION.

TUTTLE'S SCHOOL BILL.

The most important measure passed by the last Legislature, is undoubtedly the Act known as the Tuttle's School Bill (Senate Bill No. 56), whereby over a million dollars were voted for the support of the common schools of this State. This is over four times as much money as the schools have received for each of the last two years. This liberality of the Legislature exceeded our most sanguine expectation. The schools owe a debt of gratitude to Hon. B. F. Tuttle, Senator from Sonoma County, who by his devotion and untiring energy contributed largely to the success of the Bills introduced for the relief of the schools. The schools have never had more able and devoted friends in any Legislature, than in the last. Messrs. Finney, Tuttle, and others in the Senate; Messrs. Higbie, Hurlburt, Paulsell, McCallum, Cressler, and others in the Assembly, insured the success of every measure which was advanced for the benefit of the common schools. May these good friends all have an opportunity of confirming and furthering the advancement made in the cause of popular education by the last Legislature.

The liberality with which Tuttle's Bill provides for the support of the common schools, is to us, not the most important feature of the Bill. Of far more consequence to popular education, in our opinion at least, is the fact that the bill requires the school fund to be apportioned according to the needs of the several districts. Heretofore, in this State, numbers have determined educational facilities. This worked a manifest injustice, because a State system is worthy of universal support only, in so far as it gives as much as possible, the same educational facilities to all districts. In the past, as is well known, the smaller districts have received not enough funds for a three month's school; while the larger districts received enough for an eight or ten month's school. The larger districts have thus been enabled to enjoy at the expense of the smaller districts, nearly all the educational facilities provided by the State and the several counties; and this, when the larger districts in most cases, did not, proportionately, contribute as much toward the school fund as the smaller districts contributed.

Tuttle's Bill has two objects in view: first, the equalizing of the school facilities; secondly, the furnishing of a sufficiency of funds to each district. The following epitome of the provisions of Tuttle's Bill will give the *modus operandi* of arriving at these two objects:

1st. Five hundred dollars has been fixed as the minimum amount of school funds which every district must receive for every teacher assigned it.

2d. For every one hundred census children or fraction thereof, of not less than fifteen, one teacher must be assigned to a district. In other words a district having from fifteen to one hundred and fourteen census children is entitled to one teacher; a district with more than one hundred and fourteen and less than two hundred and fifteen, is entitled to two teachers, etc. For every teacher to which a district is thus found to be entitled, the district must receive five hundred dollars. In order that existing districts with less than fifteen census children, be protected, a provision has been inserted in the law, whereby a district having ten and less than fifteen census children will receive three hundred dollars. But no new district can be formed, unless there are at least fifteen census children in the proposed new district.

3d. Provisions are made that the school revenue is at least large enough to give five hundred dollars to each district for every teacher assigned it. But for most, if not all, counties, the school revenue will be large enough to leave a balance after five hundred dollars have been apportioned to each district. This balance must be apportioned, in proportion to the number of census children, among the districts having not less than than fifty census children. So that districts having between fifteen and forty-nine census children will receive no more than five hundred dollars, whilst districts having fifty and upwards, will receive more than five hundred dollars.

From this epitome it will appear, 1st.—That a district must have at least fifteen census children in order to be entitled to the minimum amount of school funds. This number may appear very small, but it was adopted in order not to discriminate too severely against the sparsely settled districts. Secondly.—Five hundred dollars is the minimum amount of school fund which every district must receive. This amount will enable a district to keep an eight months' school. After deducting the contingent expenses, and the ten per cent. from State school fund for library fund, sufficient funds will remain on hand to enable the district to pay its teacher from fifty to sixty dollars. This salary is certainly low enough. A teacher will have to teach eight months (which will in most cases be all the time for which a teacher will find employment during the year) in order to earn from four hundred to four hundred and eighty dollars; deduct from one hundred and eighty to two hundred and forty dollars for board (a very low estimate) and very little will be left for clothes, books, etc. And yet there is an ex-County Superintendent in this State, and one who has been in office for, we believe, twelve years, who contends that forty dollars a month is sufficient to pay to the teachers of small districts. That is to say, a teacher is to earn about three hundred and twenty dollars per annum, pay out of this at least one hundred and eighty dollars for board, and then dress herself out of the remainder as a lady, and buy the necessary books and literature to keep abreast in her profession. Surely our domestics are better paid, for work whose intrinsic merit and cost of fitting oneself for, is as nought as compared with the work demanded of teachers. And this ex-County Superintendent therefore says that "the idea advanced by some educators to place the minimum amount at $500 for each district will prove that the districts containing the least number of children will fare best."

We are glad, however, that the Legislature was more liberal minded, and fixed $500 as the minimum amount. We hope the next Legislature will raise this minimum to at least $600. It certainly needs no argument to prove that the best salary can command the best teacher. If we now give the smaller districts just enough funds so that they can pay teachers just enough to keep them from starving, physically at least, whilst the larger districts receive funds enough to be able to pay salaries somewhat commensurate with the services demanded, we discriminate against the smaller districts as much as ever. For naturally enough the best teachers will be found where the best salaries are paid; and the smaller districts will have to be contented with the crumbs and leavings from the educational tables of the larger districts.

We hold, therefore, that $500 is the minimum with which a district having the minimum number of census children can be expected to maintain an eight months' school. But as this amount is too small for the larger districts, we pro-

posed a way of apportioning school funds (see the TEACHER for November, 1873, page 168; or Fifth Biennial Report, page 63), by which a district with fifteen census children, would have received exactly five hundred dollars, and all districts having more than that number of census children, so much additional per census child. But this plan was held to be too complicated; and the Legislature determined that all districts having fifteen and less than fifty census children should receive five hundred dollars, and all districts having fifty or more census children should receive the balance remaining on hand after five hundred dollars have been apportioned to every district for every one hundred children or a fraction thereof of not less than fifteen.

That even this is a great step in advance will appear from the fact that of 837 districts having less than fifty census children, 786 districts (or over fifty per cent. of all the districts in the State) never yet received and perhaps never would receive under the old law five hundred dollars for any one school year.

We are sorry to see that by a bill introduced, passed and approved on the last day of the session (the full text of which is published in another part of the TEACHER), three counties of this State, viz: Sonoma, Siskiyou and Modoc are exempted from the provisions of Tuttle's School Bill. The districts of these three counties receive their apportionments in such a manner that every district will not be entitled to five hundred dollars. This bill was passed under the plea that five hundred dollars per annum is too much money for the smaller districts, and would discriminate too much against the larger districts. Under the old law the State and county school tax could never be made high enough, except it was made oppressive, to give a pro rata apportionment sufficient to give five hundred dollars to the smaller districts. So the smaller districts had seldom funds enough for a three months' school, whilst the larger districts had enough for an eight and ten months' school. The larger districts were thus enabled to enjoy in undue proportion what was paid for by the whole county and the whole State. In fact, "by right of number," the larger districts have, at the expense of the smaller ones, always enjoyed greater educational facilities than those to which their assessment roll entitled them.

Tuttle's bill provides that whilst five hundred dollars is apportioned to the smaller districts, the larger districts shall receive as much, and perhaps more, as they have received heretofore. It does this in the following manner: First, the State, by quadrupling its support to the common schools, will nearly, in many counties altogether, in some counties more than, supply the means to give the smaller districts the five hundred dollars to be apportioned to them. Nearly all, in some counties all, in a few counties more than all, the county school fund will therefore go to the larger districts. The minimum amount of the county school fund will be, in many counties, sufficient to compensate the larger districts for what they may lose on the State apportionment. But should this minimum amount not be sufficient, the larger districts certainly will have influence enough to induce the Board of Supervisors to raise county school funds enough to insure an eight months' school to those districts.

We shall fully illustrate for every county the workings of Tuttle's Bill, and the probable amount of county school fund necessary to fully carry out its provisions. To do so at the present time, would be futile, as we cannot form even an estimate of the number of census children which will be returned by the next census. In

the August number of the TEACHER we shall give a table for every county, by the use of which every County Superintendent will be enabled to comply with the provisions of Section 1817 of the Political Code. (See TEACHER, April, 1874. page 342.) On the other hand we request all Superintendents to forward to us, before the first of August if possible, by the first of August, certainly, the census statistics required to be furnished by them according to Section 1551 of the Political Code. (*Ibid.*, page 332.) The necessary blanks have already been printed, and will be mailed in ample time to be at hand for use.

TO COUNTY SUPERINTENDENTS.

For every school not visited at least once in each year, the Board of Supervisors must on proof thereof, deduct ten dollars from your salary. A record must be kept of the standing in each study of all applicants examined. On or before the first day of August in each year, a report must be made to the Superintendent of Public Instruction and to the Board of Supervisors, of the number of children between the ages of five and seventeen years, as appears by the latest returns of the Census Marshal on file in your office. We shall furnish the blanks necessary for this. County Teachers' Institute need not be held unless there are twenty or more school districts in the county.

County Superintendents will notice that the age of census children has been changed. We have therefore prepared new blanks, and give notice that all census reports must be taken only upon these new blanks. County Superintendents are requested to carefully examine all reports made to them by Census Marshals, and to reject all which are not made out in strict accordance with the instructions printed on the blanks, or which show evidence of fraud or errors on their face. County Superintendents must especially see that the same children are not listed for more than one district. Section 1640 provides that "if the Census Marshal neglect or refuse to make his report at the time and in the manner herein required, and to perform any other duty devolved upon him, he must be deemed guilty of a misdemeanor, and on conviction be punished by fine or imprisonment."

TO PUBLIC SCHOOL TEACHERS.

In addition to the duties heretofore prescribed in Section 1696 of the Political Code, it is now your duty: 1. Before assuming charge of a school to file your certificate with the County Superintendent. 2. On taking charge of a school, or on closing a term of school, immediately to notify the County Superintendent of such fact. 3. If closing any school term before the close of the school year, to make a report to the County Superintendent immediately after the close of such term; and any teacher who may be teaching any school at the end of the school year, must, in his or her annual report, include all statistics for the entire school year, notwithstanding any previous report for a part of the year. No warrant must be drawn in favor of any teacher, unless all the duties prescribed in Section 1696 have been faithfully performed.

TO BOARDS OF EXAMINATION.

All certificates granted by County, or City, or City and County Boards of Examination must be granted *only upon actual examination*. The State Board alone have the power to grant certificates upon State Normal School Diplomas or upon Life Diplomas. A County Superintendent may issue a temporary certificate, valid until the next regular meeting of the County Board of Examination to a person holding a certificate of like grade, granted in some other county of this State; City Boards may grant, without examination, certificates of like grade to holders of certificates granted in other cities. All Boards have the power to renew all certificates granted by them, except that the State Board, and City, or City and County Boards cannot renew Third Grade Certificates. No County, or City, or City and County Boards have the power to grant certificates upon State Certificate, or High School Diploma, or Diploma granted by any Normal Department of a High School, or Evening Normal School. Section 1869 of the Political Code provides that "any State, County, or City, or City and County Superintendent, or any State, County, or City, or City and County Board of Examination, who shall issue a certificate or diploma, except as provided in this Title [Title III of Part III of the Political Code, relating to Education] shall be guilty of a misdemeanor. A misdemeanor is punishable by imprisonment in the county jail for a term not exceeding six months, or a fine not exceeding five hundred dollars, or by both. In addition, the offending officers can be removed from office.

All examinations—whether by County, or City, or City and County Boards—must commence on the first Wednesday in the months of December, March, June and September. No special examinations are authorized by law. At all examinations the questions prepared by the State Board of Examination *must* be used.

Every applicant for a state, or County, or City, or City and County Certificate, of any of the three grades, must be examined by written and oral questions in algebra, arithmetic, grammar, composition, geography, history of the United States and California, physiology, natural philosophy, natural history, orthography, defining, penmanship, reading, method of teaching, oral music, drawing, and school law of California. The only difference now made between the different grades of certificates will be—not in the studies and percentage, as heretofore—but in the percentage alone. This takes effect at the next (June) examination.

All applicants for certificates, State, County, or City, or City and County, of the first, second, or third grade, must be examined in the following studies, with the scale of credits attached:

Arithmetic—written	100	School Law of California	25
Arithmetic—oral	25	Penmanship	25
Grammar	100	Natural History	50
Oral Grammar	25	Composition	25
Geography	100	Reading	50
History of the United States	50	Orthography	50
Theory and Practice of Teaching	50	Defining	25
Algebra	50	Vocal Music	25
Physiology	50	Industrial Drawing	25
Natural Philosophy	50		
Constitution of the United States and California	25	Total	925

For a State certificate, an applicant must reach 85 per cent. on the above studies, to be entitled to a First Grade Certificate; 80 per cent. for a Second Grade, and 75 per cent. for a Third Grade. If the County Board has adopted the minimum percentage prescribed by the State Board of Education, then an applicant reaching 80 per cent. on the above studies will be entitled to a First Grade County Certificate; reaching 75 per cent., to a Second Grade, reaching 70 per cent., to a Third Grade.

Attention is drawn once more to the fact that *no extra credits of any kind* can be allowed by any Board of Examination.

As heretofore, the State of Board of Examination holds no examination, but leaves this work to the County Boards. An applicant for a State Certificate

must pass his examination before some County Board, and have his examination papers forwarded (*through the County Superintendent* and *not* by the applicant) to the State Board of Examination, who examine the papers and grant a State Certificate of a grade corresponding to the percentage reached. We call once more the attention of County Superintendents to the necessity of sending, with each set of examination papers submitted to the State Board, a summary of the credits granted by the County Board. We call the attention of Superintendents also to the necessity of sending *all* the papers of an applicant, including the answers to the general questions. We furnish blanks on which to report to the State Board the standing of the candidate in each study. Below we give a copy of the blank. In the column headed "Credits on County Examination," are to be entered the credits given by the County Board; in the last column the State Board enter the results obtained on the re-examination of the papers. The report must be endorsed with the name of the applicant and the name of the county whence sent. County Superintendents are notified that unless the examination papers are forwarded within fifteen days after the close of the examination, and unless each set is accompanied by a Report, and unless *all* the papers called for by the "Report," and also the answers to the "General Questions" are sent, the papers will not be accepted by the State Board, but will immediately be returned to the sender. Examination papers must be sent either by Wells, Fargo & Co.'s Express, at the sender's cost, or by mail, *full letter postage prepaid*—three cents for every half an ounce or fraction thereof. Any set of papers not sufficiently prepaid will not be taken out of the Post Office.

REPORT OF COUNTY EXAMINATION FOR STATE CERTIFICATE.

Name of Applicant ....County.

To secure a First Grade State Certificate, 85 per cent. is required.
To secure a Second Grade State Certificate, 80 per cent. is required.
To secure a Third Grade State Certificate, 75 per cent. is required.

	Standard.	Credits on County Examinat'n.	Credits on State Examinat'n.
Arithmetic, written	100	.....	.....
Mental Arithmetic (oral)	25	.....	.....
Grammar, Written	100	.....	.....
Oral Grammar	25	.....	.....
Geography	100	.....	.....
History of the United States	50	.....	.....
Theory and Practice of Teaching	50	.....	.....
Physiology	50	.....	.....
Penmanship	25	.....	.....
Natural History	50	.....	.....
Composition	25	.....	.....
Reading	50	.....	.....
Orthography	50	.....	.....
Defining (Word Analysis)	25	.....	.....
Vocal Music	25	.....	.....
Industrial Drawing	25	.....	.....
Algebra	50	.....	.....
Natural Philosophy	50	.....	.....
Constitution of the U. S. and California	25	.....	.....
School Law of California	25	.....	.....
Totals	925	... ..	.....
	Percentag's	.....	.....

.....Grade State Certificate has been issued.

....Secretary State Board of Examination.

Sacramento,.....187

The blank certificates at present in the hands of County Boards must be changed, by inserting the additional studies required for the respective grades of certificates. The standard must be changed to 925. In other words, the back of every certificate must show the studies and scale of credits given above in the "Report of County Examination for State Certificate."

We do not furnish blanks for temporary certificates. County Superintendents are requested to use the regular blanks, but to write across their face, "Temporary Certificate," valid till (naming the date of the beginning of the first examination after the issuance of the temporary certificate).

County Superintendents are warned against the issuing of temporary certificates upon certificates granted since March 30, 1874, upon Normal School Diplomas. We have just learned of a case where a County Board granted, under date of April 13, 1874, a Second Grade County Certificate upon a so-called Kansas Normal School Diploma, said diploma having been granted upon a *one month's* attendance at somebody's Normal Academy, State of Kansas—and this, after the State Board had declined to grant a State certificate upon this pseudo Normal School Diploma. Of course, the certificate is clearly illegal, even if Section 1776 of the Political Code had not been repealed; it is undisputably illegal since the repeal of said section. County Superintendents have the power to issue temporary certificates upon certificates granted upon Normal School Diplomas prior to March 30, 1874. But all County Certificates, except renewals, dated subsequent to March 30, 1874, must have been granted *only* upon an actual examination held at a time specified by law. In short, no county certificate can be issued between March 30 and June 3, 1874, and then not again till September 2, 1874, etc. All certificates must be granted *only* upon actual examinations. We have been so explicit in this matter that County Superintendents and County Boards may not plead ignorance of the law. The penalty for granting a certificate upon any other ground than as prescribed by law, has been already given above.

SENATE BILL NO. 555.

[Approved March 30, 1874.]

AN ACT PRESCRIBING THE MANNER OF APPORTIONING SCHOOL MONEYS IN SISKIYOU, MODOC AND SONOMA COUNTIES.

The People of the State of California, represented in Senate and Assembly, do enact as follows:

SECTION 1. All school districts in Siskiyou, Modoc and Sonoma Counties which contain one hundred or more school census children shall be known as maximum school districts.

SEC. 2. The School Superintendents of said counties must apportion the State and county school moneys belonging to the counties, respectively to the school census children of the several school districts of the counties respectively, in the manner following, to wit: First—To each school census child in maximum districts there must be apportioned an equal amount. Second—To each school census child in districts having ninety such children and less than one hundred, there must be apportioned once and one tenth times the amount apportioned to each such child in maximum districts. Third—To each school census child in districts having eighty such children and less than ninety there must be apportioned once and two tenth times the amount apportioned to each such child in maximum districts. Fourth—To each school census child in districts having seventy such children and less than eighty there must be apportioned once and three tenth times the amount apportioned to each such child in maximum districts. Fifth—To each school census child in districts having sixty such children and less than seventy there must be apportioned once and four tenth times the amount apportioned to each such child in maximum districts. Sixth—To each school census child in districts having fifty such children and less than sixty there must be apportioned once and five tenth times the amount apportioned to each such child in maximum districts. Seventh—To each school census child in districts having forty such children and less than fifty there must be apportioned once and six

tenth times the amount apportioned to each such child in maximum districts. Eighth—To each school census child in districts having thirty such children and less than forty there must be apportioned once and seven tenth times the amount apportioned to each such child in maximum districts. Ninth—To each school census child in districts having twenty such children and less than thirty there must be apportioned once and eight tenth times the amount apportioned to each such child in maximum districts. Tenth—To each census child in districts having less than twenty such children there must be apportioned double the amount apportioned to each such child in maximum districts.

SEC. 3. All Acts and part of Acts in conflict with this Act are hereby repealed so far as they conflict.

SEC. 4. This Act shall take effect immediately.

SENATE BILL NO. 230.

[Approved March —, 1874.]

AN ACT TO MAKE WOMEN ELIGIBLE TO EDUCATIONAL OFFICES.

The People of the State of California represented in Senate and Assembly do enact as follows:

SECTION 1. Women over the age of twenty-one years, who are citizens of the United States and of this State, shall be eligible to all educational offices within the State, except those from which they are excluded by the Constitution.

SEC. 2. All Acts, and parts of Acts, in conflict with this Act, are hereby repealed. This Act shall take effect from and after its passege.

BOOK NOTICES.

THE ELEMENTS OF PHYSIOLOGY AND HYGIENE; a Text Book for Educational Institutions. By Thos. H. Huxley and Wm. Jay Youmans. New York: D. Appleton & Co.

Part I of this work, treating of Elementary Physiology, is written by Prof. Huxley, the well-known English scientist. We need hardly, therefore, assure our readers of the trustworthiness of whatever he sets down in this work. The author eschews the unimportant, discredited, and doubtful portions and speculations of physiology, and confines himself to whatever is essential and well-established, so as to present the present actual state of so much of physiological knowledge as is of interest to the general student. Prof. Huxley's high position as a master of pointed and forcible English is well sustained in this book.

In one important feature this work differs from all other works on physiology which we have met with. The whole plan of the work presents physiology as the science of vital actions or living forces, and illustrates the correlation and conservation of these forces. In other words, the living organism is viewed "dynamically, as a problem of the disturbance and restoration of equilibrium between the receipt and expenditure of matter and force. The functions of alimentation, circulation, respiration, and secretion, and the exercise of physical and mental power, are considered in the light of losses and gains to the system, and with constant reference to the physiological balance of forces."

Part II, written by Dr. Youmans, treats of Elementary Hygiene. As Part I shows how the "physiological balance of forces" is constituted, so Part II shows what means are within reach of all to insure and perhaps to remove any perturbation of, this balance of forces. Now, a knowledge of what constitutes and is necessary to preserve this "physiological balance of forces," is of the utmost consequence to all. If we, as teachers, can succeed in disseminating a thorough

knowledge of how to balance the "physiological income and expenditure" of the body, we have done the utmost of what we, as laymen, can do for laymen. And inasmuch as this work under notice is the only one, as far as we know, which makes the teaching of "the science of the physiological balance of forces" its principal object, insomuch the work, aside from its claims to consideration as being the work of two eminent scientists, should be insured of a favorable reception by all teachers.

ANIMAL PHYSIOLOGY; the Structure and Functions of the Human Body. By John Cleland, M. D., F. R. S., Professor of Anatomy and Physiology in Queen's College, Galway. New York: G. P. Putnam's Sons. San Francisco: Payot, Upham & Co.

This is one of "Putnam's Advanced Science Series." The principal object of the book is to supply the information required for the Advanced Course of the Directory of the Science and Art Department (Great Britain), and to furnish to the junior student of medicine a compendium of physiology preparatory to works of more elaborate character.

The material includes a great deal of comparative anatomy and physiology, certainly a desideratum, if not a necessity, in a work written for junior students of medicine and for those who are desirous of obtaining a thorough knowledge of the functions of animals. The work includes the latest advances made in the science; the grouping of facts is such that the book is adapted to readers previously unacquainted with anatomical details; the illustrations are unusually full and good, and copious directions are given throughout the book to enable the student to prepare some of the specimens most indispensably necessary to effective study.

The book is certainly a worthy member of the "Advanced Science Series."

SECOND BOOK OF BOTANY. A Practical Guide to the Observation of Plants. By Eliza A. Youmans. New York: D. Appleton & Co.

Perhaps no text book ever was more deserving the favorable reception with which it met than Miss Youman's First Book of Botany. All who have used the book, in school or in the family, bear testimony to its great excellence as a text-book. The way for a most favorable reception was thus paved for Miss Youman's Second Book of Botany, issued last year. But we are sorry to see that but very few of the promises which the First Book raised, are realized. First, matter has been crowded into the Second Book which is altogether out of place, and belongs exclusively to some such book as Gray's Structural Botany. Secondly, the treatment of the matter which legitimately belongs to the Second Book, is not in that happy style and plan which makes the First Book so valuable as a text-book.

In the hands of a skillful teacher, and one who has thoroughly mastered the plan of the First Book, and been imbued with its spirit of observing facts at first hand, the Second Book will still be of considerable value, but certainly not of such value as Gray's Structural Botany. But in the hands of a teacher who must himself be a pupil, or in the hands of a teacher who is wedded to the usual system of text-book teaching, it will be worse than useless; it will be one more of those hindrances to true education with which the prevalent style of text-books has cursed our schools.

AN ELEMENTARY FRENCH GRAMMAR. By Jean Gustave Keitch. New York: Mason, Baker & Pratt.

This Grammar is an introductory to the author's Analytical and Practical French Grammar. It is certainly far superior to the usual introductory grammars, such, for instance, as Fasquelle's. The book contains as much of the French language and grammar as can be easily mastered by grammar school pupils. The exercises are short, varied, and adapted to the wants of the student. The rules and explanations are copious, and stated in simple and concise language.

Progressive and Practical Method for the Study of the French Language. By F. Duffet. Part I. Cincinnati and New York: Wilson, Hinkle & Co.

This book is Part First of the Progressive and Practical Method, designed to teach the learner to understand, to write and to speak the French language at the earliest possible moment. The author, a teacher in Paris, France, has published a Method for Learning English, which has been very favorably received in France and Belgium. The book before us bears the imprint of being the work of a practical teacher.

Manual of the Constitution of the United States. By Israel Ward Andrews, D. D., President of Marietta College. Cincinnati and New York: Wilson, Hinkle & Co.

This book is designed for the instruction of American youth in the duties, obligations, and rights of citizenship. It is not a mere commentary upon the Constitution. The importance of a proper understanding, on the part of the student, of the great principles underlying all civil governments receive proper recognition in the first chapter, which treats of the object, origin, and nature of civil government; the different forms of government, and the peculiarity of that of the United States. The second and third chapters treat of the colonial governments, the causes of the revolution, etc., to the institution of the United States of America. Then the Constitution is taken up, and its great principles clearly and copiously illustrated. A very important and distinguishing feature of the book is the summary of the legislative provisions, in which the principles of the Constitution have been embodied. One chapter is devoted to the "Practical Operation of the Constitution," and another chapter presents the main features of the different State governments.

This book will not only be welcomed by the pupils and teachers who may have occasion to use a text-book on the Constitution, but by all who desire a book of consultation or reference, or who desire to inform themselves on a subject of such vital importance to the American citizen.

Littell's Living Age

Still maintains its front rank among the eclectics. Its serial tales, short stories, critical and descriptive essays, etc., are the cream of the foreign weekly and monthly periodicals.

The Christian Union

Is too well-known to demand of us the laudatory notice which this most marvelous, we are tempted to say, of religious weeklies so richly deserves. The promise of increased attractions made by the publisher at the beginning of the new volume, January, 1874, have been more than fulfilled, and the *Christian Union* more than ever deserves to find a place at every fireside.

St. Nicholas for May, 1874.

Since receiving the initial number of this juvenile, we have watched, rather apprehensively, we must confess, how the expectation raised by the opening number would be realized. But its excellencies have not only been sustained through the seven numbers already published, but we think that the editor's ideal, as sketched in the first number, has been more fairly realized than usually falls to the lot of editors. May the magazine meet with the increased prosperity its increasing merit so richly deserves.

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The Regular Course of Lectures in this institution commences on the first Monday in June, and continues until November. A Preliminary, or Winter Course commences early in January of each year, and is free to all matriculants for the Regular Course. Ample clinical instruction is given at the Hospitals and the College throughout the year; and the Dissecting Room and the Laboratory are open the year round.

Further information may be obtained by applying in person, or by letter, to

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THE

CALIFORNIA TEACHER.

JUNE, 1874.

VOL. XI. SACRAMENTO. No. 12

PEEPS THROUGH THE DOOR OF A KINDERGARTEN. NO. III.

Seems to me that mothers ought to know just how their little ones are taught,—that the first years of a child's life are too precious to be wrought upon by unskilled hands. Alas! too many of the children are left to the care, or neglect, of servants. Only the other day a lady, in answer to some inquiry about her children, said:

"I can't attend to my children much; I really can't. I travel with my husband, and then my circle of friends is *so* large that my calls take a great deal of time, and there's shopping and dressmaking to be attended to. No, I don't really see that I *can* get time for the children; but I have very good servants, really, very good servants."

And this mother is a Christian woman! Her time goes to affairs comparatively trivial. Her little girls are growing up with little or none of the fine home training that they should receive. This is but one instance of the many I might cite to point my moral.

Upon another morning when I went to the Kindergarten, the parable of the wise and foolish builder was read in the opening exercises, and Miss H. made it the basis of quite a serious little talk, keeping the children interested by anecdote and question.

They were asked what made the best foundation for a good child, and were drawn into the suggesting of the good points. They described a bad child, and a disagreeable child, very effectively. They were shown the importance of laying good habits in youth, and then they sang something about building well; and all marched away to their mornings' work.

Cubes again, and again they came out as orderly as possible. Nobody touched them till the teacher gave the signal, then each pair of hands divided its large cube by drawing the sides two squares apart, all saying, "one whole makes two halves." One half was then separated in a like manner as they said, "one half makes two quarters." They divided again, saying, "one quarter makes two eighths,"—then they took up the reverse process,—"two eighths make one quarter, two quarters make one half, two halves make one whole." They were then directed to divide the height of their cube; next its width was divided. Various simple questions were asked, involving the principles of the fundamental rules in arithmetic. The little cubes almost moved themselves, and little hands came up in a trice to show that their owners had found answers.

Then began the building. First, at the request of the teacher, they made successively a settee, two high backed chairs, chairs with foot-stools, a table, a desk, a well, etc. The teacher said *she* wanted to make something, but she hadn't cubes enough. She was instantly overwhelmed with generous offers; then as she availed herself of them it was pretty to see how the children watched every movement, and speculated upon the result. She had made a tall lighthouse, a harbor, a ledge of dangerous rocks, and two or three ships beyond the ledge. She spoke of the lighthouse keeper's little boy—a spare cube—as playing in the sand.

"O," cried Alice, "then if it ever rains there those ships'll be killed."

"No," said the teacher, "the light will shine through the rain, Alice."

"But the *lighthouse* will fall down when the foundation is *sand*, won't it?"

Miss F. replied that the sand was'nt deep, and the lighthouse foundation reached down to the solid rock.

"I didn't s'pose *that*, you know," said Alice gravely, and when

Miss F. had explained the use of lighthouses, told a pretty story or two about them, and answered all their questions in respect to the height of *her* lighthouse, the size of the lamp, the color of the rocks, the age of the little boy, etc., they began to build for themselves. Some repeated the lighthouse as nearly as possible. One little fellow said to another who was making a house,

"Frank, your foundation isn't straight; how do you think your house will look?"

I don't know how many times I heard the new word used, and always *correctly* used.

Presently Miss F. beckoned to a little girl, who, as I noticed, had suddenly risen from her seat and stood behind it. As she came to her teacher's side I saw what sparkling black eyes she had, and what a firm mouth.

Miss F. said in a low tone, "What is my Susie out of place for?"

"Why Miss F.," said the child, "I forgot, and the first I knew I was chewing my apron, and I'm *bound* I'll break off that habit. Suppose I should forget when I'm a grown lady and chew my overskirt! No, I'm going to stop playing every time I do it, till I learn better."

"I think you'll break up the habit very soon then, dear," said Miss F., and with a little hug of her teacher's arm Susie went back to her place.

I came away just as the children began their paper-weaving, and I thought, as I passed into the chilliness of the outer world, that one could not wish for too many of these bright little child-gardens.

On two successive visits to the Kindergarten I noticed, among other visitors, a lady of middle age, plainly but very neatly dressed. She watched the proceedings very intently, and according to my wont, I fell into harmless speculations concerning her. Among the theories that presented themselves to my fancy, I inclined to the one that made her a widow, who having lost her own darlings, sometimes gave herself the comfort, not unmixed with pain, of watching the children of happier parents. Miss Hamilton introduced me to her at recess, and to my disappointment, I found her to be a single lady, a teacher of many year's standing, which latter fact accounted for her suppressed manner I suppose, for upon most of the craft the same manner is only too evident.

Miss Evans, as she told me, had lately taken to her home some small nephews and neices suddenly orphaned. These lively boys and girls had disturbed her serenity, and overthrown many a pet theory of hers, and being seriously perplexed in regard to their training, she had made a journey to the nearest Kindergarten to acquaint herself with its practical workings.

"And what is your opinion of the system?" I asked.

"This is the sixth morning that I have been here," she replied. "I have observed the teachers and children critically. I came, let me tell you, strongly prejudiced against this method of instruction. I supposed children were occupied and amused, but I had no clear idea of *how* it was done, that it was done systematically, or that any great amount of discipline was gained, and I confess myself pleasantly surprised. I *know* that ordinary primary instruction is of a very cheap kind, and I am satisfied that true economy calls for better training in the beginning. These little ones have their impulses directed, not repressed; they love to come here I see, and I see at least ten children here who would be the pests of another school; but here they are joyous, obedient, and pleasant."

"It is really beautiful," Miss Evans went on, her pale face flushing and her eyes growing tender, "it is beautiful to think how many little lives have a blossoming time here that might have been so barren but for these gentle influences. The moral training is invaluable to any child."

"But," said I, "Mothers must give early moral training, must they not?"

"Mothers!" said she; "I do not know many *real* mothers, and I'm sorry that many who bear the name make it a mockery. These child-gardens after a *real* mother's training are admirable, and for the neglected children they are thrice admirable."

"But the intellectual part," said I, "are you satisfied with that?"

"Yes, *more* than satisfied. I see how closely the child is led to observe and to analyze, how he learns to combine his material, to combine symmetrical figures, how he learns the beginnings of so many sciences, and of the arts, and I am surprised. These inventions of theirs are a fascinating study to me."

"But," said I, wishing to draw out still more the opinions of a practical educator in behalf of my pet method, "how will it be when these children go from their play to more laborious tasks?

Will they not be more restive, and less industrious than if they had never been here?"

"I think not. What they learn here they learn thoroughly, and their habit of close observation will go far to help them. I am told that the children from the Kindergarten learn to read more readily, and with more expression than others; that arithmetic is play to them, and that avoiding precocity, which I consider the bane of our schools, they make tractable, thorough students."

"Why then," said I, "are there so few child gardens?"

Miss Hamilton tells me that there are but few places where instruction in Kindergarten is given. There is one such place in Boston, and one in Des Moines, in connection with the State Normal School. The need of such schools is not fully realized, and nearly all such ventures are made by private persons. The apparatus is expensive, and tuition must necessarily be high, which of course limits the number of children to those of wealthy parents. I can see how people would be deterred from patronizing such a school, by complete ignorance of its aims. Parents everywhere, I suppose, pay little attention to visiting schools, and are quite apt to think that the methods used in *their* education are quite proper for their children—in fact, they think the alphabet is not taken properly if the child doesn't make a wry face."

I asked Miss Hamilton how her children would behave when they were subjected to the old-fashioned drill, and she said: "Give them a new-fashioned one; make them happy and interested, and gain their hearts first of all. Where the better-fashioned teachers are to be found, I don't know," she added, thoughtfully.

"We're going to have staff work; please come, mamma," pleaded Marjorie, and so I moved near the table where she sat with her little friends. The teacher had bundles of match-like sticks in her box. They were in half inch, inch and two inch lengths. Each child had two, verified the lengths, and followed the rapid directions of the teacher in a very ready manner. They were laid in all kinds of ways, geometric terms being used with perfect readiness. The number of staffs was gradually increased, and then time was given for invention.

"What is the use of these staffs?" said I.

"We use them to teach arithmetic and drawing," said the lady in charge. "A child fails to make straight lines at first, but with the straight lines given he can lay satisfactory figures," and she showed me a large card covered with houses, hats, stoves, chairs, and I know not what, made by these busy little work-people at her table.

Since little Marjorie goes to the Kindergarten, I take a peep very often. And every time I come away from that enchanting place, I wish that all my friends could have seen what I saw. I went in late yesterday morning, and the children were all seated at their tables. Beautiful little children they were, at Marjorie's table, with their bright, happy faces all turned toward their teacher, who had just seated herself at the end with a numerical frame in her hand. She had raised it, and was going to ask some question, when one, two, three little hands were uplifted.

I have noticed one thing in this Kindergarten. No child is overlooked or unappreciated. The teachers interest themselves in the little circumstances of these little lives, as if they were each of vast importance, as indeed they are to these small men and women.

"What is it, Mamie?" she asked of the first, a baby in a long white apron, and comical red shoes. The child proceeded to relate a grand adventure with a sharp knife, whose edge had left a great red mark on the soft, white arm. The wound was kissed, and a bit of court plaster put on to supply the place of that which the restless fingers had torn off. Then the lady gave them a little lecture on the danger of sharp knives, and elicited the confession that mamma had told her not to touch it, but she had forgotten. She would never touch it again.

Charlie related his adventure with a velocipede, which had nearly run over him the night before. Jeannie told how she was going to bring some flowers to her teacher next day. She would have brought them this morning, only she was afraid she would be late.

I perceive that these children pour all their thoughts into the willing ear of their kind teachers. Happy work! What station in life can be more blessed! With whom, except the mother, rests so great a responsibility?

Miss Hamilton told me a little incident about a lovely little girl in her class. She had done something naughty at home, and her mamma said:

"Belle, do you do so at school?"

"No," said Belle.

"Then you love Miss Hamilton better than you love mamma?"

"No," said the child, "I do not love her any better, but I love her just as well."

I did not wonder that the tears stood in Miss Hamilton's eyes when she told me.

"But Miss Hamilton," I said to her yesterday, "how is it that the Kindergarten is not appreciated? Why do not influential persons take it in hand, and see that schools are established all over the country?"

"People are more and more waking up to the fact that Kindergartens form the best foundation for a good education," she answered. "One of the greatest difficulties in the way, is the prejudice of parents; the feeling, 'I learned my lessons in the good, old-fashioned way, and that is good enough for my children.' A lady said to me the other day, 'I don't believe in your system, Miss Hamilton. When I was a child, if I was given a sum to do, I did it, or was punished for not doing it, and I generally had my lessons, because I knew I must.' Look over at that table where the little ones are just taking a lesson in folding, and see if the 'new gospel of peace' is not better."

I crossed the room, and the teacher inviting me to participate I seated myself at the long table, with a square of paper before me.

"How many inches long is one side of this square, children?" was the first question put to the bright-eyed class.

A dozen hands were raised, and the answer came from the whole number, at a nod from their teacher, "Three inches and three quarters."

"That is right. Now be very careful, and see if you can tell me how many inches two sides will measure."

Eighteen pairs of hands were busy, eighteen little brains were at work over a pleasant wonder, and sixteen merry voices gave the answer, "seven inches and a half."

"How did you do it, Daisy?" asked the teacher of a bright, little girl of seven.

"Well, see," answered the child. "I lay down my square so, and there are one, two, three inches on that side, and one, two, three, on that side—that makes six; then there are two three

quarters over. The two halves make a whole one, and that is seven; now I have just two quarters left, and two quarters *always* make a half—so, don't you see, seven and a half."

Miss Hamilton, who had been standing beside me, gave me a triumphant look.

"Do you suppose the lady who learned her lessons because she knew she must, remembered them any longer than these children who learn while they play, and play while they learn? That the Kindergarten makes a child's school days too pleasant, is one of the most absurd objections that has ever been brought against it. Is life all roses that we should scatter thorns in the pathway of these little ones, lest they be made happier than their Heavenly Father designed? Are there no crosses and trials for them in the future, that we should begrudge them the simple joys of their babyhood? Heaven help these children and preserve the Kindergartens, when parents fear that school-life will be *too pleasant.*"—*Rural Home.*

[From the Christian Union.]

INTELLECT IN POLITICS.

By Henry Ward Beecher.

It has long been an accepted saying that the ablest Americans could not hope for the highest honors of the Republic. In both Senate and House it has become the fashion to sneer at the few scholarly men who nourish their statesmanship with the wisdom of all preceding time, as theorists, whose winnowed thought is chaff and husks to the healthful stomach of a vigorous young democracy. There seems even to be a popular impression that "the best form of government the world has seen" is not simply a responsive instrument, good or bad as good or bad men use it, but an unchangeable entity, incapable alike of advance or declension; an earthly Providence, not to speak it profanely, whose arm is not shortened that it cannot save. This theory makes the quality of its agents a matter of minor importance. There is, moreover, a great host of shrewd, uncultivated voters, with-

out special reverence for so shadowy a deity as the Constitution, who hold that since aristocracies commonly call to their council the best culture and highest refinement the land can furnish, it must therefore behoove a democracy to depend upon a rude energy and native wit. Learning may do well enough in Europe, it is supposed, but what America needs is fresh minds, ingenuity, smartness.

Our schools are much to blame for this general folly. Up to the close of the war there was hardly a college in the United States where more than four weeks out of four years was devoted to instruction in the domestic and political history of the country. In most of these institutions, while the history and geography of Greece and Rome absorbed half the complete term, those of the United States were neither mentioned in the course nor demanded as a preliminary study. The New England township is the model upon which Jefferson and his associates labored to found the Federation. Even to-day New England collegians are few who can explain the theory of local government in their native villages, and designate the names and the duties of the various offices. Yet the America which has grown up from this foundation has done more for humanity in her hundred years of national existence than did all Europe in the thousand years that followed the birth of Christ. As to political economy, and the significance of current events, they speak in unknown tongues to the average student.

And if the collegian comes to the responsibilities of political action without any clear notion of government as a science, what shall be said of the graduates of the common schools, who compose the vast majority of voters and of officials? The theory of our system of education contemplates the making of good and intelligent citizens. The practice concerns itself little with that end. It is not vital that the American boy should know the height of Chimborazo, nor the sources of Asian rivers, nor even the arbitrary rule that governs nouns in apposition. But it is vital, since national well-being depends upon the intelligence and morality of his vote, that he should know the height of national honor to which we stand distinctly pledged, the sources of the national wealth, and the natural laws that govern political economy. Half the time wasted in the mere memorizing of abstract grammar, and of superfluous geography ,would

suffice to instruct pupils in the vast study of the daily newspaper, of the theory and history of our Government, of the simple and beautiful laws of natural production and exchange, teaching them thus the real power and dignity of the ballot. The best of the late speeches in Congress upon inflation will furnish any teacher with a manual of political science, which a few bright talks of half an hour a day would make not only intelligible but fascinating to boys whose wits were roused by the compliment to their understanding implied in a discussion of public questions.

We confess not to have been surprised at the lame legislation of Washington, not at the revelations of common corruption. A pint measure cannot hold a quart. If a man has the capacity to deal with politics, as every American has opportunity, and has never been taught that government is the highest science, why should he not undertake it as a thrifty trade? And why should not a trades-union of unscrupulous ignorance combine to keep out of the business any skilled, and therefore dangerous, competitors? The men who misrepresent the better sense of the land are no more blameworthy than their constituents. Nor is there reasonable hope of their immediate betterment.

Of course, a great crisis, like that of the civil war, would once more call the intellect and moral earnestness of the nation to the conduct of its affairs. And, of course, the slow education of mistakes, disgrace, and financial disaster tends to the same end.

But we cannot afford these wasteful processes of instruction. We ought to send out from our schools and colleges a generation which shall take up citizenship with clean hands, and with zeal according to knowledge, having drawn from intimacy with our great Past the inspiration to create a greater Future. Nor should we delay the inception of this larger training. Intellect and moral earnestness are the soul of this Republic. If ever we suffer them to depart it cannot be long thereafter before the body stinketh.

Harpers' Bazar lately had an amusing sketch, illustrative of the well known line so commonly used for a postscript, "Excuse haste and a bad pen," representing a dilapidated pig-pen, with the occupants escaping and scampering off in all directions.

[*From the Connecticut School Journal.*]

RESPECT FOR CHILDREN.

BY REV. H. E. HART, DURHAM.

It is surprising how little respect is sometimes shown to little folks. It would seem as if these little ones were not thought deserving of even the slightest regard; as if respect is not for them until they are grown up. Here is a serious evil. Children like to be treated handsomely as well as older people; they respond to kind and appreciative treatment, and give respect in return to such as really respect them. Let me indicate some of the ways in which respect is withheld; but first, I would show the fundamental reason for respecting them:

Every one of these little folks is a man. "Homo sum," can the smallest of them say, in declaration of their natural dignity. The tiniest babe in the cradle is a man-child. Highest authority there is indeed for that title. Around the cradle of the little one, if the glory of its high nature were visible to the eye, there would be a glory like the aureola we sometimes see around the heads of pictured saints. Because of the human nature there is in every child, every child is entitled to respect.

Their joys, sports, ambitions, aspirations, are entitled to respect. They have as real a *right* to those as any man has to property, liberty, life. I do not speak of those as things that should be permitted them; they are theirs by right. True, they cannot compel their elders to give them these, and therefore people take advantage of their weakness and deprive them of the things they ought to have. Let a man deprive his equal of his right, and see what he gets for his audacity.

Their woes are entitled to respect. To deny that children have woes is equal to denying that birds and helpless creatures have tormentors. Being little does not exempt one from suffering. Some of the bitterest woes are born by little hearts that are full of sorrow and have no comforter. The crash of the china doll—there is anguish in the shriek the little owner sends forth. The breaking of the set of little dishes—what a desolation of spirit follows that disaster. The destruction of the playhouse by some unfeeling fellow—a playhouse constructed with much care, deliberation, and skill—a feeling of

misery follows such a calamity. Many little possessions of slight intrinsic value, may be of inestimable value to a child. The misery of having to wear some unfashionable or unsuitable article of clothing has been the making of a gulf that has aided to separate a boy from his mates, and made him feel strangely among men for the rest of his life. A little girl was made to wear a bonnet of a color out of all harmony with the rest of her clothing, to church on the Sabbath. She was miserable the whole day, and the memory of that mortification is still vivid, though she is a lady past middle life. She was not to blame. The sense of harmony and of the fitness of things in her soul—a sense that God gave her—was opposed and wounded. Delicate sensibilities received a rude handling, and real suffering was the result. Such delicate feelings need delicate treatment. They are a divine endowment, just as much as reason; not an arbitrary development of human art or skill.

People sometimes insult children. To call a man a fool would be a foolhardy undertaking. But people will call children fools, or intimate as much, without feeling that they do any wrong. For example: Older people, when they find their notions are not accepted by the young, will draw across their sensibilities this old saw: "Young folks think old folks are fools, but old folks know young ones to be so." The younger person probably did not call the older one a fool; he only disputed the correctness of his sentiments, a thing which anybody in this land may do; and the older person declares, without qualification, that young folks, that is, all young folks, young folks as a class, are fools. What is that but an insult? Any boy who has been sawed with that saw can remember the indignation he felt; and remember, too, perhaps, that it was only the fear of a thrashing that kept him from avenging the insult on the spot. Had he been a little older he might have retorted, "There is no fool like an old fool." Or he might have argued the point in this manner: "Do you mean to say, sir, that I, your son, or grandson, am a fool? Then what must my father and grandfather have been?"

How many times has a boy been given a dull axe to chop with, a poor pen to write with, a soiled and unattractive old book, almost worn out by older brothers and sisters, to begin to learn lessons in. Is it any wonder he became indig-

nant, and cried, and declared he would have nothing to do with such a shabby thing? He felt insulted; he was insulted. A man would not treat another man like that; he would fear the consequences; but the little chap could not help himself, and had to put up with it. They took advantage of his helplessness. But is it right to take advantage of little folks in that way because one has the power?

Children are insulted by addressing them in a disrespectful manner; by calling them by a disagreeable nickname; by speaking of some natural defect that they may be afflicted with; by not hearing them through with patience when they want to speak in their own defense. They have natural rights as well as their elders. The same feeling that leads us not to notice a disability in man or woman, should lead us to appear unconscious of a natural disability in a child. One has no right to address any person, young or old, unless he does it with respect and civility. A child is a man in the divine generic sense. He is a man-child. Let his manhood be respected.

The real nature of a person comes to the surface in dealing with children. The teacher who will be hard on a poor child, because he can insult such a one with impunity, is wanting in the first elements of manliness. Respect for man as man, apart from his circumstances, is enjoined by the highest authority. Inspiration bids us "honor all men." As the apostle wrote it, it is, "*honor all.*"

Dr. Channing made a vivid impression on the mind of one who was telling him how certain refractory sailors were reduced to obedience by flogging. "What," said he "*strike a man!*" If he saw how children and youth are sometimes insulted, he might exclaim, in a way to put the offender's conscience piercing him, "What! insult a child?" Being a child or a youth is not an atrocious crime; it is not anything discreditable even.

Leaving now the wickedness of showing disrespect to children, there are enough advantages to be gained by showing them respect to compensate for all the inconveniences that may be encountered in doing it.

One of these advantages is, you win the child's respect. It is all important in governing children that the teacher be able to command their respect. They are as ready to respect what is worthy as grown people. The early Christian church had few

greater heresies than this modern falsity, "Boys do not know when they are treated well." Is not the respect shown by some teachers to their pupils, the secret of their power over them? Thomas Arnold always regarded his boys as truth-tellers. He did not suspect them first, he believed them first. Even with the lower forms he never seemed to be on the watch for boys; and in the higher forms any attempt at further proof of an assertion was immediately checked: "If you say so, that is quite enough —*of course* I believe your word;" and there grew up in consequence a general feeling that "it was a shame to tell Arnold a lie—he always believes one." His biographer, who was once a pupil of Arnold's, always says his practice was to treat the boys as gentlemen and reasonable beings, and make them respect themselves by the mere respect he showed them.

Thus one acquires influence over pupils. The sway over the heart of a man is the sway over the whole man. A boy is a man—a little man. The germs of manliness are there—manly traits, too, very often. This respect and influence will not end with the discipline of the school-room. There are certain ones who are looked to for advice; whose example and manner are quoted and imitated. We never ask advice of men for whom we feel no respect. Men generally act as society and their fellows expect them to act. We naturally respond to the sentiment that is presented. We are apt to do as we are done by.

He who respects children and youth will get honor by it, and they who do not respect them will get dishonor. How can anyone respect himself who does not respect the young and the weak? To be tyrannical, impudent, unjust, to lord it over those who are too weak to make resistance, is to show some of the most unlovely elements of human character. Such characters ought never to be invited to preside among young people anywhere.

Also by showing due respect to children one is likely to obtain success. The world is full of people who need help. Children need it; not for getting lessons altogether, or in great part, but they need help to enable them to cherish kind feelings, to preserve the delicacy of their sensibilities, retain confidence in the general good intention of society and of those who dwell about them. Every teacher, every man or woman who is true, is a tower of strength to all younger and weaker spirits; and every one who shows to young people genuine and deserved

respect, will gain a power over them that will make the most difficult things in government and study possible. One of the fundamental principles of good society is to secure to every one his rights. Children have rights. Their misapprehensions should be, of course, corrected; but what we and they know belongs to them, should be freely granted. The influence upon children determines their character when grown. All who have anything to do with them, and who deal with them truly, will be amply rewarded in the characters and disposition of the next generation. Sow well and you shall reap abundantly.

[*From the Atlantic Monthly.*]

EDUCATION IN GERMANY.

A small pamphlet in German, now before us, affords fresh and authentic information of the most interesting and valuable description about Prussian common school education as it exists at the present time. It comprises the revised and improved programme of studies prescribed by the government, together with the detailed requirements for the normal training and the examination of teachers. What makes this little *brochure* extremely noteworthy, is the fact *that it is the last word on the subject from the most competent pedagogists or schoolmen in the world.* It is evidently a complete whole, a harmonious *system*, where each perfect detail is blended in the general excellence. It contains a clear and precise statement of the aims and requirements in respect to each subject of instruction. The time to be devoted to each branch is also prescribed. The following studies are obligatory for all children: Religion, the mother-tongue, including writing and grammar, arithmetic, practical elementary geometry, *realien* (comprising geography, history, the elements of Natural History, and the rudiments of physics), drawing, singing, gymnastics; and for girls, needlework. To each of the last four branches the pupils of the upper classes are required to give two hours weekly. In giving the gymnastic exercises, the teachers must follow the course laid down in the official manual prepared for the purpose.

To the average American teacher the above schedule of studies will probably appear rather formidable; and most likely

it will not be apparent to him how *time* is to be found to teach them all to any purpose, in the period allotted for the course of instruction in the common school. But the Prussian teachers, it is said, do find time for this without subjecting their pupils to the "cramming" process, or to what we call "high pressure." Nor is it very difficult to discover how the Prussian teachers are enabled to do what seems to most American teachers impracticable. This programme throws much light on the subject. In the first place, it distinctly indicates what is to be accomplished, and puts just and reasonable limitations upon the requirements. And so the Prussian teacher does not fritter away the time of his pupils in attempting to teach them a great mass of useless details which bookmakers have seen fit to print in text books. But this is just what most American teachers are doing to an immense extent, greatly to the profit of bookmakers and book publishers, and at the same time to the great detriment of their pupils. And how can they be expected to do otherwise? No such teacher's guide as this before us has been furnished by any American State. In the Massachusetts School Law the subjects to be taught are named, and nothing more. It is so in all the States, or in nearly all. The consequence is, the teachers are very generally left by the local authorities to teach what there is in the prescribed text books. There are exceptions to this state of things, we are aware, in many of the city schools, where there is an efficient superintendence exercised by the school boards and their experienced officers. In New York, Boston, Chicago, St. Louis, Cincinnati, and some other cities, programmes have been adopted, which are intended to secure a rational and economical handling of the subjects to be taught. But nowhere is this intention satisfactorily realized. And speaking generally, it is substantially correct to say that the American teacher has for his guide, instead of a carefully prepared rational programme, a list of prescribed text books, too numerous and too voluminous by half, the contents of which he is expected to teach his pupils as best he can. He knows very well, from experience, that whatever else his pupils may be expected to know, they must not fail to answer any questions on the text of the prescribed books, so far as they have been studied. Hence, of necessity, his brief business must consist in giving out lessons and in hear-

ing recitations. In fact, the characteristic of American teaching, in all its grades, is that it consists mainly of the hearing of recitations from text books. The Prussian method is entirely different. The Prussian teacher *teaches his pupils and works with them.* The text book is used only for reference, and as an aid to the pupils in preparing reviews. In this way the Prussian teacher makes very short work of geography, on which our American teachers feel compelled to waste a great amount of time, and so must crowd out drawing or singing.

But this pamphlet not only indicates the right way of handling the subjects of instruction; it shows also how the teachers are prepared for this sort of work. A perfect programme is a most useful instrument in skilled hands, but it is only so much waste paper in unskilled hands. The Prussian ministry of instruction is by no means content simply to put forth a well-contrived course of study, and then tell the local authorities to carry it out. It prescribes, at the same time, the course of culture and technical training for the teachers, to enable them to handle the programme according to its letter and spirit. And what is more to the point, it provides in abundance the institutions in which this culture is imparted. Prussia was the first country in the world to set the example of establishing normal schools, the earliest of these institutions dating back as far as 1701. In 1819 it was decreed that ten should be established, one in each province. Now there are eighty-eight. In the whole German Empire there are one hundred and forty-three. And the course of training in these professional schools varies from three to six years.

If this pamphlet, which we have taken as our topic, could be translated and printed, and distributed largely throughout America, it could not fail to render an important service to the cause of popular education.

SYSTEMATIC THINKING.—A great deal is said nowadays about the power of modern thought; but it would be well to remember that all the thinking which bears fruit is systematic thinking. Many a young man imagines himself to be thinking when he is merely day-dreaming. Thinking implies an active state of mind. Calling up images, holding them fast, and arranging

them in order; not a passive condition in which troops of ideas flit across the mental vision like figures in a kaleidoscope. Thinking, worthy the name, is work—systematic, calm and connected; and the man who has not got his mind so disciplined that he can thus command it, is not yet a thinker. That systematic thinkers are so few is attributable to early and bad training. Not one teacher in fifty in our primary schools deems it of importance to teach children how to study, and a less proportion are competent to do this if they would. The most of them think their duties are comprised in keeping an orderly school, hearing recitations, assisting pupils to do hard sums and allotting tasks. Especially in the latter do they excel. Memorizing is with most of them a name for mummery—a thing to be done by holding the head in one hand, swinging first one foot and then the other, and forcing the lips to repeat a formula until they will run of themselves long enough to get through recitation by very force of momentum. And this laborious, meaningless task, they think, is study. In other words, it is to them the teaching of the lips to move from force of habit, while the mind may be wandering anywhere and everywhere. Thus a vacant, wandering habit of mind is secured with the spelling lesson, and ground in with the rules of grammar; and unless by rare good chance the unfortunate, overtasked and mentally disgusted young intellect meets in its onward progress some one who can show it the mistake, or has native genius to discover it without help, it grows into habitual slovenly-mindedness. After all, teachers are no more to blame than parents who demand that progress shall be measured by pages of a book rather than by power to think.—*Scientific American.*

JOHNNY BECOMES ACQUAINTED WITH SOMETHING HE CAN'T SEE.

By Adam Stwin.

[The following, which we find in the Young Folks' Department of the *Christian Union*, is such an admirable specimen of an object lesson, that we insert it as a model for those who wish to do something with lessons in objects in their schools.]

Johnny is a seeker; and like every other little boy who keeps his wits about him and watches things, he is continually making discoveries—the best of all ways for getting knowledge.

The other morning he found on my table a small piece of painted steel, shaped like a capital U, only there was a short bar of iron across the top, which made it look like a flattened D.

"What a funny little horseshoe!" said Johnny, picking it up. "Why didn't they put some holes in for the nails?"

"That isn't a horseshoe," I said. "It's a magnet."

"Magnet! What's that?"

As Johnny asked the question, he turned the thing over in his hands, and pulled the bar a little to see how it was fastened on. The bar slipped, and when he tried to pull it back into place, one end came off, so that the bar hung only by a corner.

"Never mind," I said, as he looked up with a scared expression that plainly said, "I didn't mean to break it!"

"It isn't broken. Put the bar back."

Johnny put it back, and it sprang into place with a sharp click.

"That's funny," he cried again. "What made it jump so? And what makes it stick? It doesn't feel sticky."

"We call it magnetism," I said. "Now, take hold of the bar, and see if you can pull it straight off."

"I can't. It sticks fast."

"Pull harder."

Johnny braced himself for a strong pull. Suddenly the bar came off, and the little fellow went tumbling backward into the middle of the room.

"Well, I never!" he cried good naturedly, picking himself up. "What did you say makes it hold so hard?"

"Magnetism," I said again.

"But what *is* magnetism?"

"I couldn't tell you if I tried; but I think you could learn a good deal about it with that magnet."

"Could I? Let me try."

That is one of Johnny's ways of amusing himself. He likes to find out things for himself as well as most boys like to work at puzzles.

"You will find a lot of things in that box of odds and ends that may help you."

Saying this, I went about my business, leaving the young Faraday to pursue his studies as best he might. When I came home in the evening, I found him more puzzled than I left him.

"That's the queerest thing I ever saw," he said. "Some things just jump at it as though they were alive; some things it pulls; and sometimes you can lift a whole string of things with it, holding on to each other just like a swarm of bees; and some things it doesn't pull a bit."

"That's a very long lesson you've learned," I said. "What things does it pull?"

"These," he said, pointing to a pile of things on one side of the box. "And these other things it doesn't pull."

"Let us see what you have in this pile," I said, looking at the first little heap, "Keys?"

"Trunk keys," said Johnny. "It doesn't pull door keys. I tried ever so many."

"Try this key," said I, taking one from my pocket. "This is a trunk key. See if the magnet pulls it."

"No-o," said Johnny, thoughtfully, "it doesn't; but it pulled all the rest of the trunk keys I could find."

"Now try this key to the door of my office."

Johnny tried it, and to his great amazement the key stuck fast to the magnet.

"Clearly," said I, "the magnet pulls *some* door keys, and fails to pull some trunk keys."

Johnny was puzzled more than ever. He looked at one pile of keys, then at the other, thought a moment, then picked up my trunk key, and said, "This key is *brass;* the rest are iron."

"That's so," I said.

"And all these door keys that the magnet didn't pull," he continued, "are brass too. May be the magnet can't pull brass things."

"Suppose you try. But first see if there are any brass things in your pile of things the magnet pulled."

Johnny looked them over and found not one. In the other pile he found a brass nail, some brass pins, a hinge, and several other articles made of brass, none of which the magnet would pull. Then we tried the castors of my chair, and all the other brass things we could find, with the same result.

"There's no use trying any more," said Johnny at last. "The magnet won't pull brass."

"Then, there's another matter settled," I said; "*The magnet does not pull brass.* Is there anything else that it does not pull?"

"Wood," said Johnny. "I tried lots of pieces."

"Anything else?"

"Stones," said Johnny, decidedly.

"What are these?" I asked, holding up a couple of heavy stones he had put among the things the magnet pulled.

"I guess I put those there by mistake," said Johnny, testing with the magnet a number of stones in the other pile.

"Try them," I said.

"Oh!" he said, as the magnet lifted them, "I forgot. It does lift *some* stones."

"Well, what else have you in that pile of things the magnet did not pull?"

"Glass, leather, lead, bone, cloth, tin, zinc, corn, and a lot of things."

"Very well. Now let us see what the magnet does pull."

"Iron keys," said Johnny, "and nails."

"Here's a nail in this other pile."

"That's a brass nail. The magnet only pulls iron nails."

"Is this an iron nail?" I asked, taking a small white nail from the first pile.

"No; that's tin, I guess, or zinc. It oughtn't to be in that pile."

"Why not?"

"Because the magnet does not pull tin or zinc. See!" he added, touching first a bit of tin foil, then a piece of sheet zinc, with the magnet.

I handed him the white nail, and said, "Try this."

"That is queer!" he said, as the nail sprang to meet the magnet.

"Try this strip of tin."

"Oh! that isn't tin; it is just tinned iron. You showed me that the other day. That'll stick."

"May be the nail is only covered with tin, and is iron inside. *Is* it?" he concluded eagerly, as I broke the nail in two to look at its interior.

"I think it is," I said. "Try it with the magnet, and then try this white shoe-nail that is white clear through."

The shoe-nail did not stick; the other did, and we classed them accordingly.

"What else have we in this pile?"

"Needles, hairpins, screws, wire—*iron* wire," Johnny added quickly. "Brass wire doesn't stick, you know."

"How about this?" I asked, taking a small coil of red wire from my desk.

"I guess that wont stick," said Johnny.

"Why so?"

"Because that's copper wire, and the magnet doesn't seem to pull anything that isn't iron."

Much to Johnny's satisfaction, the copper wire had to be placed with the things not affected by the magnet. Then I took up the two stones, one rusty red, the other quite black, and said:

"What about these?"

"I guess they must have iron in them too," said Johnny. "Have they?"

"They have," I replied. "They are iron-stones, as the miners call them, or ores from which iron is made. But what made you think there was iron in them?"

"Because they wouldn't have stuck to the magnet if there wasn't, would they? Anyhow, all these things that do stick have iron in them."

"Quite true. So you have learned another very important fact about the magnet. Can you tell me what it is—the fact, I mean?"

"*The magnet pulls iron*," said Johnny.

"Good," said I; "and it is also true that the magnet does *not* pull—"

"Things that are not iron," said Johnny.

"True again," I said, "so far as our experiments go. There may be things besides iron that the magnet will pull, and there may be times when the magnet will not pull iron; but, so far as we have tried it, the magnet pulls iron always, and never anything else."

"But you haven't told me what makes it pull iron."

"That I cannot do any more than you. We see that it does pull, and can study generally the manner of the pulling—it will take you a long time to learn all about that; but just how it is that the pulling is done, or what makes it, no one has yet found out. For convenience we call the pulling power *magnetism*. You can keep the magnet and study its action further. When you've tried it in every way you can think of, come to me, and I'll show you ever so many curious things you can do with it."

DEPARTMENT OF PUBLIC INSTRUCTION.

ALL THE amendments to the School Law published in the April number of the TEACHER, are in full force and effect, and were so from and after their passage.

THE BLANKS for Teachers' Reports, distributed by this Department this year, remain unaltered from those distributed last year.

THE QUARTERLY EXAMINATION QUESTIONS prepared by the State Board of Examination for the use of County, City and City and County Boards of Examination, are not to be opened till the day of examination, and then only in presence of at least one member of the Board of Examination, other than the County, or City, or City and County Superintendent. Every Board of Examination *must* use the Questions prepared by the State Board.

WE CALL attention to the provisions of Section 1751 of the Political Code: The State Board may grant State Certificates to those who, in examination before County Boards, have attained the standard of proficiency prescribed by the State Board of Education; *provided*, that the original examination papers be forwarded to the State Board of Examination *within fifteen days after the close of the examination*. Except this provision of the law is complied with to the letter, an application for a State Certificate upon a county examination can not be considered by the State Board. We call attention also to the Instructions to Boards of Examination, published in the May number of the TEACHER.

TO COUNTY SUPERINTENDENTS.—No blanks will be sent from this office except a requisition is received, stating *how many* of each kind of blanks are needed. Order at one and the same time all the blanks you may require; do not write to-day for Teachers' Reports, to-morrow for Census Marshals' Reports, and next week for Trustees' Reports. *Do not order in excess of your needs.* We are prepared to fill all orders for blanks *actually needed*, but we are not prepared to furnish blanks enough to turn each County Superintendent's office into a respectable stationery shop.

THE FOLLOWING is a list of the blanks furnished by this Department. Any blank not enumerated will not be furnished:

Teachers' Certificates.
Teachers' Reports.
Trustees' Reports.
Census Marshals' Reports.
Appointment of Census Marshals.
Election notice for electing Trustees.
Election notice for voting tax.
Certificate of Election of Trustee.
Certificate of Appointment of Trustee.

Agreement between Teacher and Board of Trustees.
Trustees' Order on County Superintendent.
Superintendent's Warrants on County Treasurer.
Teacher's Register.
Blanks for Superintendent's Annual Report.
Blanks for Superintendent's Report of Census Statistics.
Record Book of County Board of Examination.
Labels for District Library Books.

WE ONCE more call the attention of County Superintendents to the new blanks we have sent for the taking of this year's census. *Use none but the new blanks.* County Superintendents must accept no reports, except the instructions printed on the back of the blank have been strictly complied with. These instructions are as follows:

1. Obtain from the Trustees or County Superintendent the exact boundaries of your District. 2. The law requires you to visit each habitation, house, residence, domicil or other place of abode in your District, and to enumerate the census children of the same by actual observation and interrogation. 3. Report all the statistics asked for. Incomplete reports are not to be accepted by the County Superintendent. Do not fail to read the headings of the different columns to be filled in. 4. Include in your report all children (whose parents or guardians are residents of the District) that are absent, attending institutions of learning. Do not include in your report children who are attending institutions of learning or such benevolent institutions as the Deaf and Dumb, Blind and Orphan Asylum, in your District, but whose parents or guardians do not reside therein. 5. If your District lies partly in two adjoining counties, you must report to the Superintendent of each county the full statistics for each county. 6. Be particular that the children listed in columns 1, 2 and 3 are properly distributed into columns 5, 6 and 7. In listing the children who have attended private schools at any time during the year, be careful to list only those who have *not* attended public schools, but private schools *only*. 7. Foot up each column. *Check your additions.* The sum of the totals of columns 5, 6 and 7 must equal the sum of the totals of columns 1, 2 and 3. 8. You must subscribe to the annexed oath, and deliver, on or before the first day of July, a copy of this report to the County Superintendent, and a duplicate copy to the School Trustees. 9. According to Section 1640 of the Political Code, if the Census Marshal neglect or refuse to make his report at the time and in the manner herein required, and to perform any other duty devolved upon him, he must be deemed guilty of a misdemeanor, and on conviction, be punished by fine or imprisonment.

EVERY CENSUS MARSHAL must subscribe to the annexed oath:

I do solemnly swear (or affirm) that the facts set forth in the within report are just and true, according to the best of my knowledge and belief, and were collected in strict accordance with law and the instructions given above. So help me God.

.....
School Census Marshal.

Sworn and subscribed to before me, a ..... of the County of ..... and State of California, this ..... day of ..... Anno Domini 187 .

.....

NOTE.—This oath may be administered by any School Trustee, or the County Superintendent of Common Schools.

INSTRUCTIONS TO COUNTY SUPERINTENDENTS.—1. Section 1551 of the Political Code provides that "each School Superintendent in this State must, on or

before the first day of August, in each year, report to the Superintendent of Public Instruction, and to the Board of Supervisors of their respective counties, the number of children in their counties between the ages of five and seventeen years, as appears by the latest returns of the Census Marshals on file in this office." The data derived from these reports must be reported by the Superintendent of Public Instruction to the Controller, on or before the tenth day of August of each year. A strict compliance on the part of the Superintendent of Public Instruction with this provision of the law, is necessary to insure the levying of the State school tax. County Superintendents will, therefore, see the necessity of promptly reporting to us; their reports must be sent in time enough that they be on file in this office *on or before the first day of August*. Any neglect on the part of the County Superintendent to send the report, or to send it in time, may endanger the State apportionment for his county. 2. In making out this report, be careful to assure yourself of the correctness of the Census Marshals' Reports. See that the *Instructions to Census Marshals* have been fully attended to by the Census Marshals. 3. Reject all Census Marshals' Reports which show evidence of fraud or errors on their face. See especially that the same children are not listed in more than one report. 4. Report all the statistics asked for. Incomplete reports will not be accepted, but will be treated as no reports. Do not fail to read the headings of the different columns to be filled in. 5. Be particular that the children listed in columns 1, 2 and 3 are properly distributed into columns 5, 6 and 7. 6. Foot up each column. *Check your additions*. The sum of the totals of columns 5, 6 and 7 must equal the sum of the totals of columns 1, 2 and 3. 7. Keep a copy of the report, and enter it in your Annual Report. 8. You must subscribe to the annexed oath, which may be taken before the County Clerk, or any officer authorized to administer oaths:

I do solemnly swear (or affirm) that the facts set forth in the within report are just and true, according to the best of my knowledge and belief, and were collected in strict accordance with law and the instructions given above, from the latest Census Marshals' Reports on file in my office. So help me God.

.....

School Sup't of.....County.

Sworn and subscribed to before me, a ..... of the County of .... and State of California, this ..... day of ..... Anno Domini 187 .

.....

THE BLANKS for making the above report are already printed, and will be mailed on or before the first of June. Every County Superintendent ought to be able to have the Report mailed by the tenth or fifteenth of July, and we earnestly request County Superintendents to send in their Reports at the earliest practical moment. We shall have to examine every report before we can compile our report to the Controller. Besides, we need the data furnished by the Reports in order to furnish, through the August number of the TEACHER, County Superintendents with the information necessary to comply with the provisions of Section 1817 of the Political Code.

THE COUNTY SUPERINTENDENT'S Annual Report, required by subdivision 14 of Section 1543, is due at this office on or before the tenth of August. We draw

thus early the attention of County Superintendents to this matter that it may not happen again, as it did last year, that a County Superintendent did not commence to collect his statistics till the very day when the Report was due at this office. The Law provides now that if a County Superintendent fails to make *a full and correct report at the time fixed by the Superintendent of Public Instruction*, he forfeits one hundred dollars of his salary. No days of grace will be given. All reports must be on file in this office by the tenth of August, otherwise the Board of Supervisors will immediately be notified that the County Superintendent has failed to make a report. Last year we enforced the penalty in only one instance; this year we hope not to be compelled to enforce it in a single instance.

THE NECESSARY blanks will be mailed on or before the first of June, and County Superintendents are urged to enter for every district the statistics as they are reported by Teachers, Trustees or Census Marshals. Set the whole of July apart for the making out of the Report, and do not wait till the last moment, and then find that all the Reports have not been received.

WE CALL the attention of Teachers and County Superintendents to subdivisions 1 and 2 of Section 1696, by which every teacher, before assuming charge of a school, must file his certificate with the County Superintendent, and on taking charge of a school, or on closing a term of school, immediately notify the County Superintendent of such fact. A warrant must be drawn in favor of a teacher only when he has strictly complied with these provisions of the law, as well as performed all the other duties prescribed by Law. By the above quoted provisions, teachers will be prevented from assuming charge of a school except they are the holders of certificates in full force and effect, and thus a very serious trouble, which has heretofore frequently arisen, is avoided. Then, by holding the certificate till the teacher has notified him of the closing of the school, the County Superintendent can always compel a teacher to hand in his reports, and we avoid then the not unfrequent occurrence of a teacher closing his school, selling his Trustees' Order, and leaving the district and county without reporting to the County Superintendent.

LIST OF DIPLOMAS AND CERTIFICATES granted by the State Board of Examination from January 10 to April 20, 1874. The date following immediately after the name, gives the time of the expiration of the diploma or certificate. [In the list of Holders of Life Diplomas, published in the last *Biennial Report*, page 288, second line from the bottom, read *Miss Jessie Smith* for *Miss Jennie Smith*. In the list of Holders of Diplomas and Certificates, published in the February number of the TEACHER, page 280, seventh line from the bottom, read *Margaret I. Crothers* for *Caroline H. Crothers*.]

Educational Diplomas.

Bragg, Miss M. J., Feb. 19, 1880.
Bugby, Mrs. B. N., March 24, 1880.
Elliott, Mary E., April 10, 1880.
Gabriels, Mrs. C. E., Jan. 17, 1880.
Garlick, J. P., April 10, 1880.
Hatch, J. L., Feb. 19, 1880.
Hiatt, Pleasant, March 24, 1880.
Hughes, A. B., March 24, 1880.
Johnson, G. W., March 24, 1880.
Jenks, David W., April 10, 1880.
Kimball, C. A., April 10, 1880.
Lyser, Albert, Feb. 19, 1880.
McDonald, W. P., Jan. 22, 1880.
McDonall, Mrs. J., March 24, 1880.
McGowan, Patrick H., March 24, 1880
Meagher. Jno. F., April 10, 1880.
Merritt, Julia E., March 24, 1880.
Ormstrong, Flora S., March 24, 1880.
Sherman, Miss M. F., Feb. 19, 1880.
Yates, W. A., April 10, 1880.

First Grade Certificates.

Aaron, Miss Amelia, March 24, 1878.
Arthurton, S. L., March 24, 1878.
Auld, Cecilia M., March 24, 1878.
Bellinger, Mary, Feb. 19, 1878.
Bennett, Minnie A., March 28, 1878.
Bird, Mary, March 28, 1878.
Blackstaff, M. E. D., March 28, 1878.
Bonnard, Miss E. A., Feb. 19, 1878.
Boyden, Edgar A., April 10, 1878.
Boyle, Miss S. J., Feb. 19, 1878.
Boynton, S. S., April 10, 1878.
Brooks, E. R., March 28, 1878.
Brumley, Miss M. J., March 24, 1878.
Buel, Emma W., April 10, 1878.
Burke, Jennie, March 24, 1878.
Carswell, Ella W., March 28, 1878.
Ciprico, Miss Anita, Feb. 2, 1878.
Clark, Mattie A., April 10, 1878.
Conroy, Lizzie, Feb. 19, 1878.
Coolidge, Miss A., Jan. 22, 1878.
Cooper, Mrs. F A., April 10, 1878.
Cory, Lizzie, March 28, 1878.
Coyner, J. M., Feb. 2, 1878.
Crumry, Alice A., March 28, 1878.
Day, Frances M., March 28, 1878.
Elliott, Mrs. E. J., Feb. 19, 1878.
Ford, J. A., April 10, 1878.
Garland, Miss A. A., April 10, 1878.
Geer, Emily F., March 24, 1878.
Goepp, G., Jan. 22, 1878.
Gourley, Jennie A., March 24, 1878.
Goustiaux, Albertine, Jan. 22, 1878.
Gray, Miss A. L., March 24, 1878.
Grigsby, Florence, March 28, 1878.
Guild, Pacific, March 28, 1878.
Hammond, S. Estelle, March 28, 1878.
Hammond, Hulda A., March 28, 1878.
Henn, Carrie M., March 28, 1878.
Henning, David F., April 10, 1878.
Hutchins, Kate, April 10, 1878.
Hochholzer, Harriet, Feb. 2, 1878.
Jackson, Ella A., March 28, 1878.
Jacobs, Miss R., Feb. 19, 1878.
Jewell, W. Jerome, March 28, 1878.
Johnson, Isabelle, March 28, 1878.
Keefer, Sallie E., March 28, 1878.
Keegan, Mary A., March 24, 1878.
Kellogg, A. E., Feb. 19, 1878.
Kent, Isabelle B., March 24, 1878.
Kessler, Christian, Feb. 19, 1878.
Ketchum, Ariadne G., March 28, 1878.
Keys, Mary E., Feb. 19, 1878.
Kneedler, Susie E., March 28, 1878.
Knowlton, Miss L. M., Feb. 19, 1878.
Lanfranchi, C., Jan. 22, 1878.
Leonard, Carrie, March 24, 1878.
Levy, Daniel, Feb. 2, 1878.
Lighte, Miss Pauline, March 24, 1878.
Lipman, Miss M., Feb. 19, 1878.
London, Jacques, Feb. 2, 1878.
Lynch, Ida M., April 10, 1878.
Martin, Edith J., March 28, 1878.
McKean, Miss A. M., Feb. 19, 1878.
Mead, Emmeline R., March 28, 1878.
Miller, Amanda, March 28, 1878.
Miller, Chas. W., March 28, 1878.
Mullens, Miss H., Jan. 22, 1878.
Mumford, Mrs. M. E., March 28, 1878.
Murdock, Maria E., March 28, 1878.
Murphy, Annie L., March 28, 1878.
Murphy, Isabelle, April 10, 1878.
Nachtman, Miss Justina, Feb. 19, 1878.
Ormsbee, Miss Jane, Jan. 17, 1878.
O'Rourke, Maggie, March 28, 1878.
Persing, Georgia, Feb. 2, 1878.
Savage, Miss Nellie H., April 20, 1878.
Slater, Charlotte, April 10, 1878.
Sprott, Maggie, Feb. 19, 1878.
Stevens, Miss Annie, Feb. 19, 1878.
Stincen, Miss E E., Feb. 19, 1878.
Swain, Orlando E., April 10, 1878.
Swan, Amanda, April 10, 1878.
Taylor, Mary A., March 28, 1878.
Taylor, Miss Olivia, April 10, 1878.
Tunnell, Byron J., April 10, 1878.
Waldron, S. A., Feb. 19, 1878.
Wash, Wm. A., March 28, 1878.
Weeks, Annie C., April 10, 1878.
Wells, Addie H., March 24, 1878.
Wheeler, Mrs. J. D., Feb. 2, 1878.
Whitely, Emma, March 24, 1878.
Whiting, Julia M., March 28, 1878.
Woodward, N. L., March 28, 1878.
Wright, Abby, Feb. 2, 1878.
Young, Nestor A., Feb. 19, 1878.
Zimmerman, W., Jan. 22, 1878.

Second Grade Certificates.

Banks, Lizzie, April 10, 1877.
Butler, Orpha, March 24, 1877.
Campbell, Ruth G., Feb. 19, 1877.
Clark, Robert M., Jan. 17, 1877.
Congdon, A. R., Feb. 19, 1877.
Cooney, Ellen, April 10, 1877.
Covilland, Chas. J., April 10, 1877.
Gibbs, Cynthia C., March 24, 1877.
Hart, Maria L., March 24, 1877.
Henderson, Miss M. J., Feb. 19, 1877.
Jackson, Mrs. J. L., Feb. 19, 1877.
Manley, Geo. P., Jan. 17, 1877.
Pedler, Alfred, April 10, 1877.
Rodahan, B., Jan. 17, 1877.
Shirley, James W., April 10, 1877.
Shuey, Jewell, April 10, 1877.
Simpson, J. M., March 24, 1877.
Symonds, Jennie C., April 10, 1877.
Stone, O. S., April 10, 1877.
Talmadge, Minnie, April 10, 1877.
Troy, Patrick, Feb. 19, 1877.
Wickliff, Mrs. Elvira, March 24, 1877.

Third Grade Certificates.

Chapman, Miss F. L., March 24, 1876.
Colby, Phebe S., April 10, 1876.
Hagen, Miss Louise C., Feb. 19, 1876.
Hulett, Eva M., April 10, 1876.
Mulgrew, Cassie A., April 10, 1876.
Mulgrew, Mary Jane, April 10, 1876.
Summerfield, Alice, April 10, 1876.

BOOK NOTICES.

THE EDUCATION OF AMERICAN GIRLS. Considered in a Series of Essays. Edited by Anna C. Brackett. New York: G. P. Putnam's Sons. San Francisco: A. Roman & Co.

This book undoubtedly owes its origin to the appearance of Dr. Clark's *Sex in Education;* and impliedly, though not professedly, it is a protest against the conclusions arrived at by Dr. Clark. The reader will thus naturally first weigh the controversial value of the book, and must then confess himself greatly disappointed. Those portions of the book whose immediate object is the controversion of Dr. Clark's position, are the most unsatisfactory, in plan and execution, of the essays composing the book. Leaving, however, these portions aside, and considering only those articles which can be considered as independent contributions to the cause of girls' education, the book is interesting and instructive, and will prove a worthy and timely contribution to popular education.

ESSAYS ON EDUCATIONAL REFORMS. By Robert Herbert Quick. Cincinnati: Robert Clark & Co. Price $2 00.

This book gives an interesting account of the schools of the Jesuits; and the leading characteristics of the pedagogical systems of Ascham, Montaigne, Ratich, Milton, Comenius, Locke, Rousseau, Basedow and the Philanthropin, Pestalozzi, Jacotot and Herbert Spencer.

The book is a very able one; the different and frequently antagonistic theories are discussed not only with catholicity of spirit, but also with that good judgment which springs from an extensive practical acquaintance with the subject.

It would be well for us "were ours one of the countries where it would be considered a truism that a teacher, in order to exercise his profession intelligently, should know something about the chief authorities in it." Those who are honestly desirous that their teaching shall be as good as possible, are comparatively very few, and even these "are not likely to employ the best methods if they invent as they go along, or simply fall back upon their remembrance of how they were taught, perhaps in very different circumstances." They must derive benefit from, and should constantly consult the knowledge of, what has already been said and done by the leading men engaged in education, both past and present. Heretofore this was very difficult on account of the want of books. Professor Seely has deplored the paucity, nay entire absence of works on the history of Education, written in the English language. Says Professor Seely, "Good books are in German. I have found that in the history of Education, not only *good* books, but *all* books are in German, or some other foreign language." This want of books in English, has now been partially supplied by the volume under consideration. We trust that

all who desire to have a science of pedagogy, and who desire to see teaching rise to the level of a profession, and to see the teacher removed from the category of a mere day laborer, working so many hours a day hearing lessons, will not solely theorize—of which we have far too much—but learn also the important lessons which experience teaches. For this no better book has at present appeared in English than *Essays on Educational Reforms*. We earnestly commend it to teachers and all interested in popular education, and may its lessons hasten that educational reform which is so urgently needed in our public schools.

Model Dialogues. Compiled by Wm. M. Clark. Philadelphia: J. W. Daughaday & Co.

This is a new collection of dialogues, tableaux, etc. for the various school exhibitions, and for home amusement. The book contains less pharisaical or sentimental pieces than is usual in such collections, but that the pictures it professes to give of life are as cheerful and humorous as claimed, we have failed to find.

Manual of Gesture. By Albert M. Bacon. Chicago: S. C. Griggs & Co. San Francisco: A. Roman & Co.

This book is in the department of gesture, what Dr. Rush's *The Philosophy of the Human Voice* is in the department of vocal culture. Copious illustrations, a complete system of notation, and varied selections for practice, teach, illustrate and impress the principles of this art so important to orators and public speakers.

The Poet's Gift of Consolation to Sorrowing Mothers. New York: A. S. Barnes & Co. Price, $1 50.

A handsome, choicely printed, full-gilt volume, containing the most notable and favorite poems contributed by poets on *Lent Jewels*, as Dean Trench so pathetically calls the children called hence. The title of the book, *The Poet's Gift of Consolation to Sorrowing Mothers*, is itself the fittest commentary of the book.

How to Teach; a Manual of Methods for a Graded Course of Instruction. By Henry Kiddle, Thos. F. Harrison and N. A. Calkins. New York: J. W. Schermerhorn & Co.

Mr. Kiddle is the City Superintendent of Public Instruction in New York City; Mr. Harrison is First Assistant Superintendent of Grammar Schools in New York City, and Professor of Methods and Principles of Teaching, in Saturday Normal School; and Mr. Calkins occupies a like position in the Normal School, and is, besides, First Assistant Superintendent of Primary Schools and Department, in New York City. The *Manual* embraces the methods of instruction of the subjects usually pursued in primary, intermediate, grammar and high schools, and also suggestions relative to discipline and school management.

We have been thus particular in giving the professional standing of the authors and the object of the work, in order to emphasize a remark made above, that ours is *not* a country "where it would be considered a truism that a teacher, in order to exercise his profession intelligently, should know something about the chief authorities in it." The book under consideration bears the date of 1874; yet the advances in education made of late years, especially in primary instruction, and more especially in primary arithmetic and local geography, are either unknown or ignored. Even the most superficial acquaintance with the labors of German primary teachers, for the last five or six years, would have enabled the writers to

write or compile a book which would have been a credit to them, a timely contribution to pedagogical literature, and a valuable aid to the teacher. As it is, the book, being a mere rehash of methods in vogue, or even already superseded for years, is an indifferent attestation of the professional abilities of the writers, and a snare and a delusion to the honestly inquiring teacher.

FIRST STEPS IN GENERAL HISTORY; a Suggestive Outline. By Arthur Gilman. New York: Hurd & Houghton.

We heartily welcome this work. The dry facts and dates of events with which outlines usually bristle, and which prove a hindrance instead of a help to the pupil, give place to what Mr. Gilman claims to be a "*suggestive outline*" of the principal eras in the history of each country. The pleasing style of the author must contribute considerably to stimulate the student to make thorough investigations. Valuable features of the volume are the tables which establish the historical connection of the nations, giving thus views of contemporary events; maps, purposely free from details, exhibiting the geographic relations of the countries, and the index so arranged that it is of great service in tracing the progress of great movements that have affected more countries than one.

One suggestion of the author we deem worthy of the serious attention of teachers. Aside from the interest in history which may be thus awakened, such exercises will be invaluable in teaching composition. To carry out the plan suggested by the author, he gives at the end of the volume a *Bibliography* of such books as will enable the student to pursue the subjects further, and to contemplate them from different points of view.

"It is hoped," says Mr. Gilman, "that those using this book will find it practicable to associate with it the study of biography, geography and literature, by causing the lives of the chief actors upon the stage, at given times, and the epochs themselves, to be made the subjects of themes by the pupil.

"By thus making the Gracchi, Peter the Hermit, the Children's Crusade, the Wars of the Roses, Dundee of Claverhouse, the Campbells of Argyle, Oliver Cromwell, Prince Eugene, George Washington, the subjects of essays, the pupil may be taught to look more minutely into topics than can be merely hinted at in an outline. The study of history may thus be made one of the most interesting and entertaining in the whole curriculum."

ST. NICHOLAS for June

Opens with a well-told seaside story, "How the 'Gull' Went Down." "The Heronry among the gnarled Pines," is an interesting hunting sketch. Miss Clara G. Dolliver contributes a characteristic sketch, "Mrs. Slipperkin's Family." "The Little Reformers" instil a lesson not amiss for the pondering of older heads. "A Famous Garden" and "The Coast-Wreckers," are the solid pieces. The three serials are as good as ever. Several humorous sketches, in prose and poetry, will excite the risibles of the youngsters. Nearly all the articles are profusely and finely illustrated.

THE INTERNATIONAL REVIEW. Six times a year. New York: A. S. Barnes & Co. $5 per annum.

This bi-monthly review made its first appearance on the first of January, 1874. Three numbers have so far been published, and we are thus enabled to form a pretty correct estimate of the value of this new enterprise.

The Review appeals only to those who are inclined to seriously and thoughtfully

ponder the problems which agitate the preseut political, commercial and social world. The Review has very happily chosen the topics which have most profoundly agitated society on both sides of the Atlantic. "Our Late Panic," "Fires in American Cities." "Monopolies," "Indian Citizenship," and "Our National Currency," receive careful attention at the hands of the ablest American writers on their respective subjects. The other side of the Atlantic is represented by "The Prussian Church Law" (by Baron von Holtzendorff, Munich), and "Working Classes in Europe" (by Thomas Hughes, M. P.). The contributions to science are, "Transit of Venus" (by Prof. Hilgard, of the U. S. Coast Survey), and "Deep Sea Exploration" (by Dr. W. B. Carpenter, the well-known scientist). Art is represented by "Art at the National Capital," and "Practical Work in Painting" (by Philip Gilbert Hamerton). "Universal Education" and "Upper Schools" represent education. The international articles are "Nationalism and Internationalism," and "International Arbitration." Biography is represented by Dr. Noah Porter's article on John Stuart Mill.

While the body of the Review thus gives the best thoughts on the most serious problems agitating the present age, we are surprised that the reviewing of books, one of the most important departments of a Review, is intrusted to hands so ill-fitted for the work. Some of the reviews appearing in the last number, smack more of the criticisms expected from newspapers, than from a dignified quarterly or bi-monthly.

The Sanitarian for May.

From the contents of this excellent number we draw particular attention to the following articles which are of the greatest importance to non-medical people.

1st. "The Sewage Question or the Dry-Earth Method of treating Refuse." We wish every newspaper throughout the land would agitate this subject until it receives that attention which its impartance demands.

2d. "Traps and Trapping" speaks of the drains of our homes.

3d. "Hygiene of Dwellings" and "Principles of Ventilation" commend themselves to every family.

We notice that the publication office has been removed to 234 Broadway, New York. Terms $3 00 a year.

The Tennesee School Journal

Is the name of a new educational monthly which entered the field Jan'y 1, 1874. It is the official journal of education for the State of Tennesee. From the first three numbers before us we are very favorably impressed with this new enterprise.

No number later than March has come to hand. Where are the April and May numbers ?

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